

WESTERN INDUSTRY



• Industrial gunners—not men from Mars—are these shot-blasting operators in an Emeryville, Calif., factory.

Twenty-Five Cents

VOLUME X

NUMBER 1

January, 1945



AN AMPHIBIOUS SURPRISE PARTY

Here is something even Jules Verne didn't think of . . . An iron monster, as thoroughly at home in the water as it is on land. Many a stout fighting heart owes his life to the LVT WATER BUFFALO, designed

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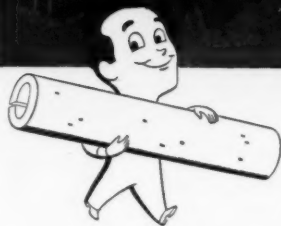
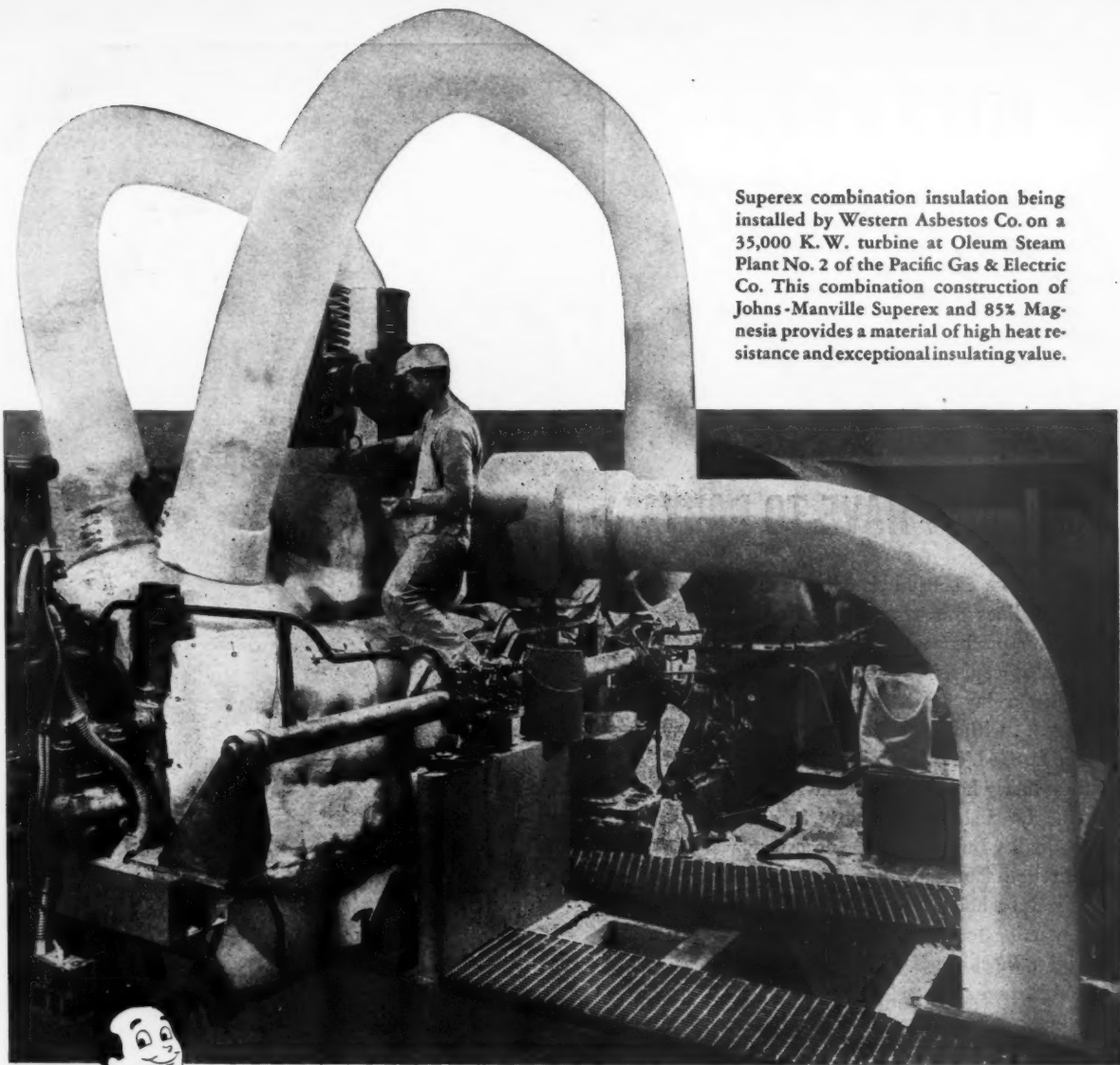
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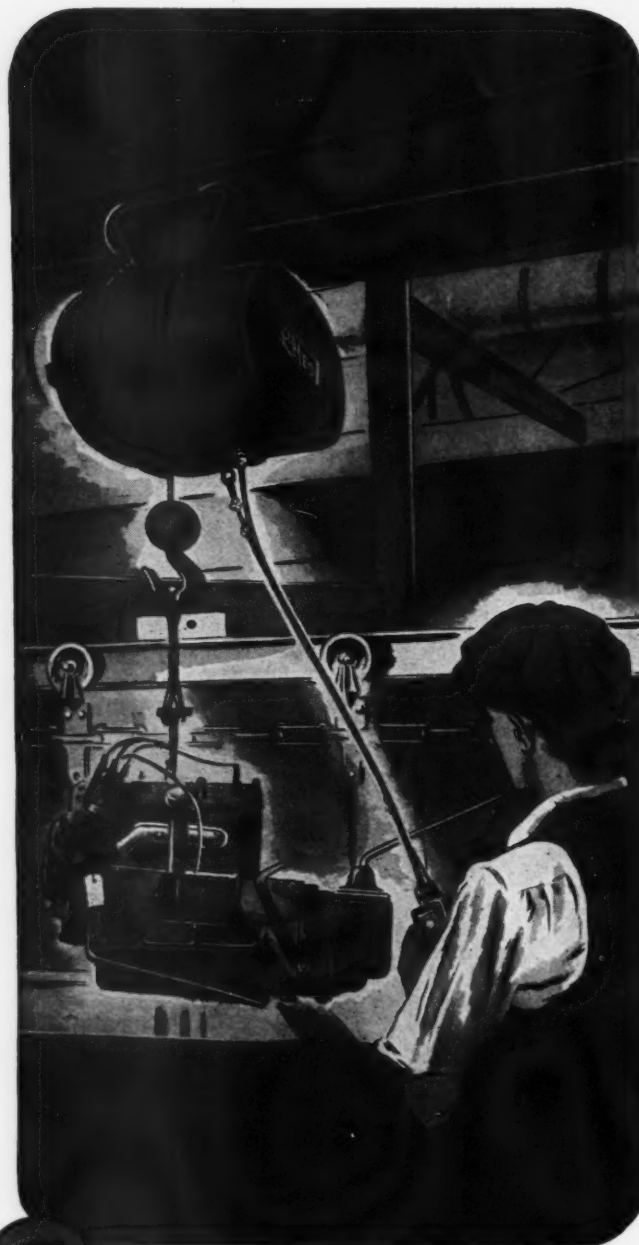
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EDITORIAL COMMENT

A Sad Lesson

YOU CAN'T take chances with a rattlesnake until it is dead. That is the lesson of the German pre-Christmas offensive which suddenly changed our hopes for an early termination of the European war into a realization we still have a tremendous task ahead of us. Evidently it is a lesson that had to be learned by the entire nation, from the top clear down to the bottom.

So long as the iron determination of the Germans either to rule the world or to ruin it remains, nothing but an opposite and still more powerful determination on our part will be sufficient to bring victory. We cannot pass this duty off on the military commanders or the federal authorities at Washington; the determination has to be manifested by everyone, no matter how unimportant his part may seem, for after all the whole is only the sum of its parts.

Obviously we are facing a nation more experienced in war than we are. Although we are more experienced in mass production than the Germans, and to a still greater extent than the Japanese, their experience with the utilization of output for waging war, and particularly with the use of manpower for that purpose, runs over a much longer span of years. Therefore we must surpass them with the utilization of intelligence, which has so wonderfully flowered under our heritage of freedom.

It does not mean that our postwar planning must be shelved or forgotten; it is entirely right to be foresighted regarding the necessity of preparation for readjustment to peacetime conditions. But apparently we had begun to feel that the war would somehow drift along, and the rattlesnake surprised us. Let us hope this experience teaches us not to make the same mistake with the Japanese.

Cooperative Effort

THE LEADING article in this issue, "Congressional Situation Endangers the West's Future," presents a situation so serious in its implications for the West that we took the trouble to send out advance proofs of the main portion of it to as many of our readers as time and labor shortage would permit (yes, editorial offices have labor shortages, too).

Making sure that the industrial future of the West is adequately protected at Washington involves, first of all, sufficient Western representation on the key committees in Congress, but it does not stop there. The various administrative agencies must be dealt with also, and for that work as well as for Congressional contact industry should make full utilization of the services of the Washington representatives of the various Western chambers of commerce, who are possessed of both a Western viewpoint and Washington experience.

It is a cooperative effort all the way along, and the meeting of the new Western Regional Council at Salt Lake City in February can well be the occasion for reaching a general Western understanding on this matter. When people learn that they must work together and can work together, the rest is easy.

The time is coming when industry will regard it as customary procedure to hold consultative sessions with its congressional representatives when they are home from Washington, and to maintain regular contact with them at the national capital. The latter is already being done to a considerable extent through the representatives of Western chambers of commerce.

WESTERN INDUSTRY

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OUR COVER PICTURE

• Repair work for the navy is daily becoming more important in the industrial production picture on the Pacific Coast. Already some shipyards are being converted to repair bases, while manufacturing plants of all kinds are filling up with navy repair jobs. The cover picture shows shot blasting operations at the Westinghouse plant at Emeryville.



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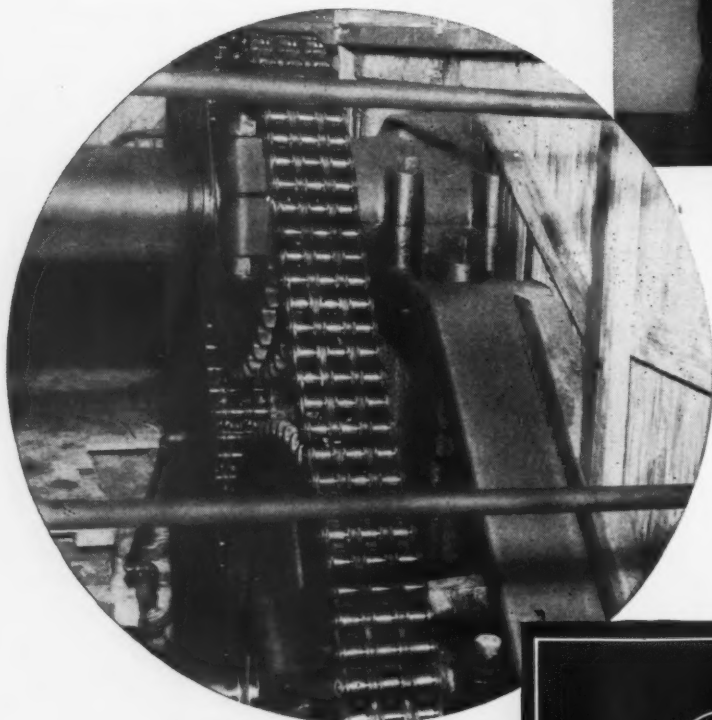
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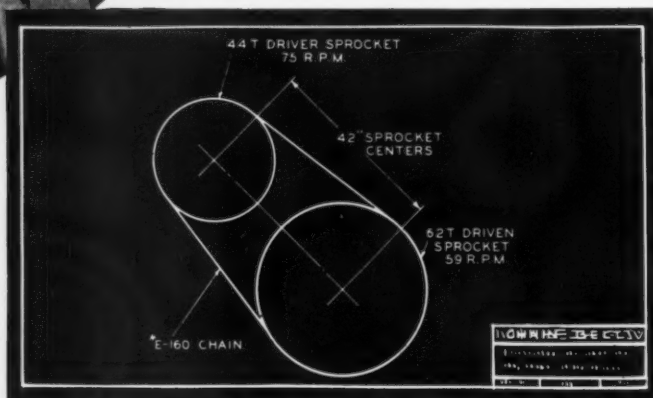
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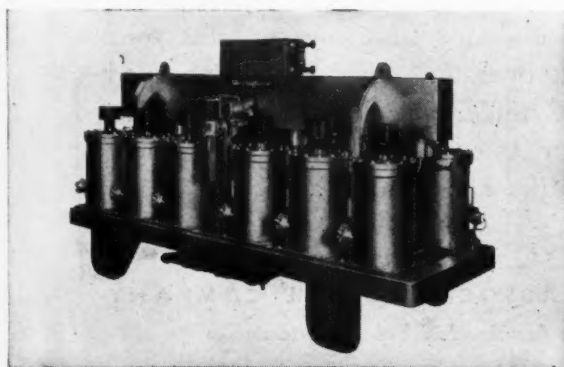
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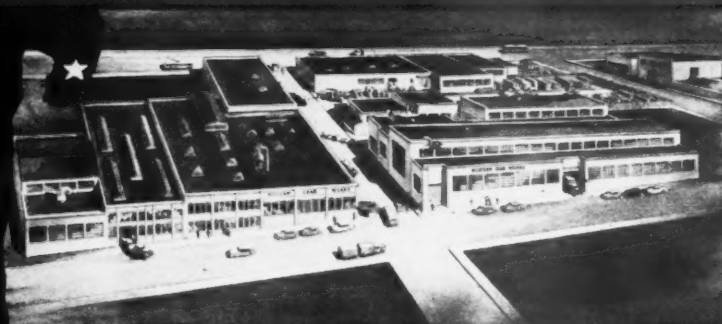
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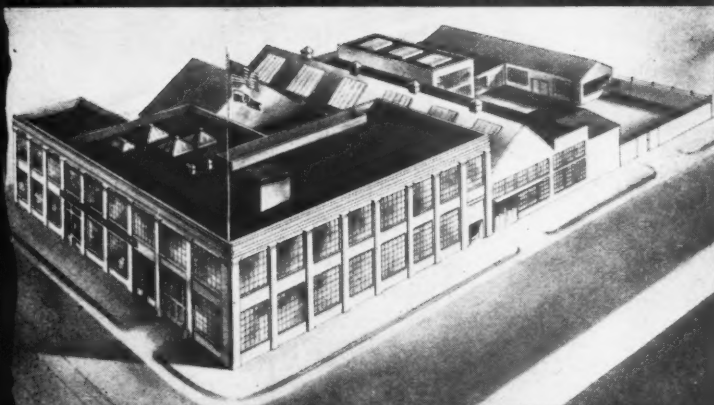
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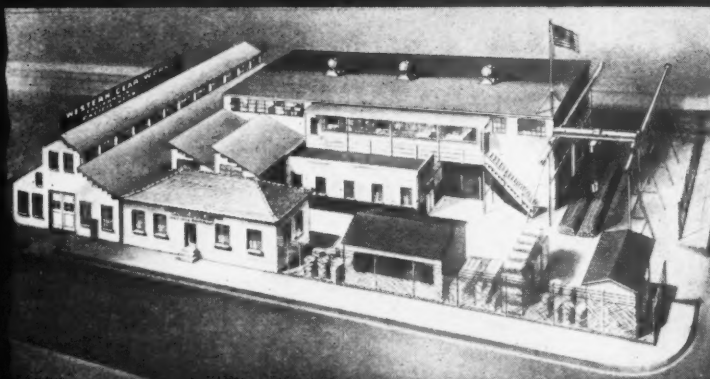
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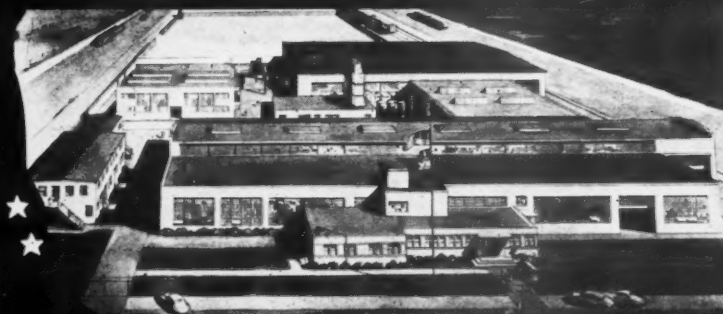
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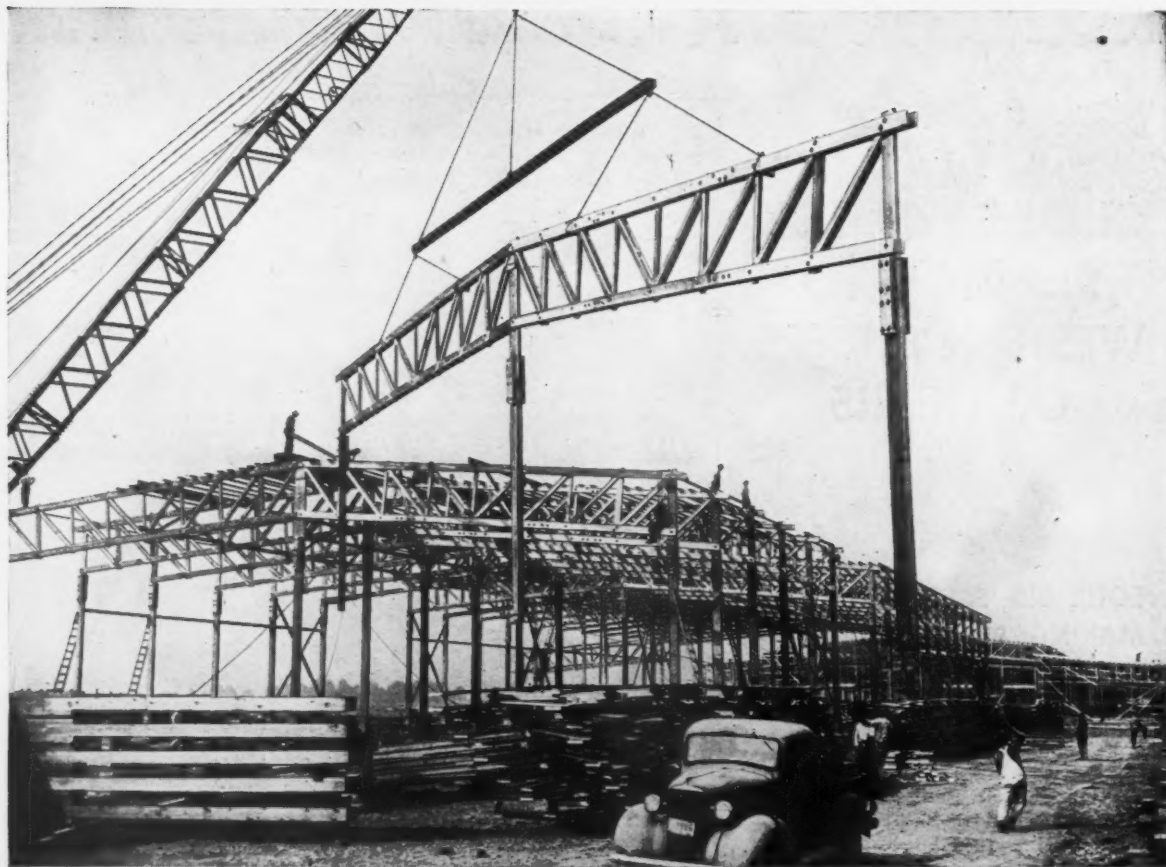
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Solve TRUCK SHORTAGE Problem with FRUEHAUF TRAILERS

This Fruehauf Trailer is replacing 5 trucks and 4 drivers. The tractor was converted from a truck which had been retired from service.



The truck shortage created by the War was a serious problem for the delivery department of Van DeKamp's

Holland Dutch Bakers. 135 stores in Los Angeles and 25 in Seattle had to be stocked daily with fresh products — and quickly.

New trucks were not to be had. They called upon the transportation engineers of the Fruehauf Trailer Company for help. Two trucks which had been retired from service were converted to tractors for hauling two Fruehauf Full-Automatic Trailers of standard design.

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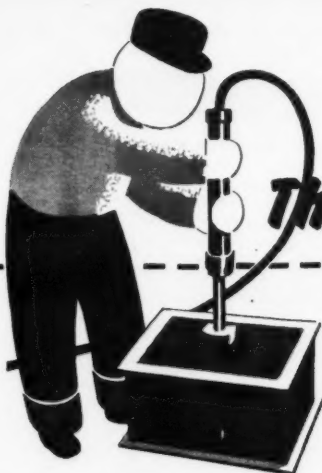
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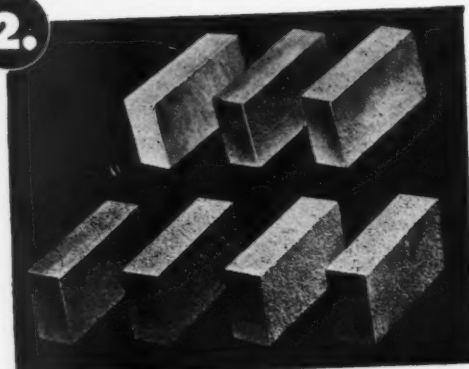
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1.



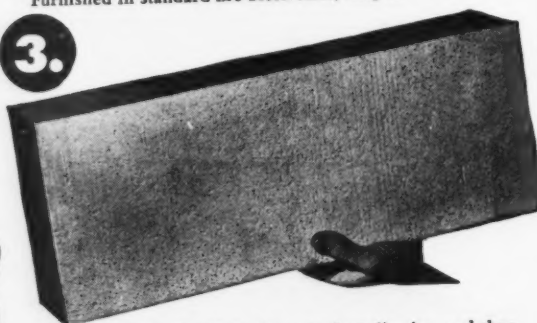
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2.



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3.



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Spotlight

on the NEWS

WESTERN INDUSTRY
FOR JANUARY, 1945

VOLUME X

NUMBER 1

Industry and Politics

Politics long has been referred to as a "great game," but with the recent emergence of the government as the most important financial and economic factor in industrial life, it may now properly be called the national game. Consequently, if industry in the West continues to confine its participation to making campaign contributions and putting up sporadic fights on matters in which it is immediately and directly interested, it will never win any games. How to play the game effectively as well as fairly, by seeing that Western representatives in Congress are placed on important committees and that they understand the industrial problems of the West, is told in this issue (pages 23-27).

Economical Incentives

If employees can be made cost-conscious as well as volume-conscious, that's really something. Consolidated-Vultee Aircraft Corporation have done that with their supervisors at the Vultee Field plant at Downey, California, and two of their industrial engineers tell the story in this issue of *Western Industry* (pages 28-30). It is a matter of carefully setting up standards and measuring sticks for costs before fixing an incentive rate.

Production Accomplishments

Too bad that space limitations do not permit us to tell more of the outstanding production stories from Western war plants. Not only are they interesting in themselves, but also they are significant of how Western manufacturers may be able to compete in surprising fashion with long-established Eastern firms after the war. What the Pacific Screw Products organization have been able to accomplish with automatic screw machines (pages 31-32) is a good example.

Will Solve Itself

Railroad revenue figures (pages 33-36) show that if the Western railroads could hold their present traffic volume after the war they could, without harm to themselves, reduce freight rates to encourage

the development of industry in the West. The corollary to this proposition is that reducing the rates would encourage volume, and the final installment of our article on the railroad freight rate situation indicates that probably the railroads themselves will take the initiative after the war in making suitable adjustments. For railroads that are overcapitalized it will not be too easy a matter, but they will have to find the answer themselves.

Postwar Preview

Senator McCarran failed to get much sympathy for his "freeze the East" proposal when he got out to the Pacific Coast in November and interviewed business representatives (pages 58, 59), but a good bird's-eye view of postwar prospects in regard to metals, shipbuilding, and other things was presented.

Promotions and Pay Boosts

Some of the discussion that came up at the Pacific Northwest Personnel Management Conference about the need for careful study of salary advances and choices for promotion was reported in our December issue. An example of a practical method for canvassing the plant for information on which to make such decisions appears in this issue (page 38).

Keeping Trucks Busy

As industrial truck fleets get larger and more numerous, supervision of operations becomes necessary in order to prevent idle time. Boeing have worked out this problem very successfully at the main plant in Seattle (pages 52-53) and some of the details of their plan may be successfully applied to smaller operations.

One World; One Water

When we think of Wendell Willkie's "one world" it is usually our relations with other continents that we have in mind, but right here in the West, on our southern boundary, we have a problem with Mexico over Colorado River water (pages 44-46) that is going to give us plenty of opportunity to work out an amicable and satisfactory adjustment.

More Safety; More Manpower

The direct relation of safety to manpower supply is being stressed by the Committee for Conservation of Manpower in War Industries, which is putting on a special safety drive in the next few weeks (page 36). Older employees are not necessarily more difficult to educate in safety measures, it has been found by the Oregon Industrial Accident Commission (page 61). In their safety schools old-time loggers, for example, have responded very well.

Economy in Welding

Out of the mass of experience in welding being accumulated in West Coast shipbuilding jobs, many valuable ideas are now being sifted. Among them is the value of reducing welding sizes (pages 40, 42), which has resulted in a change from large-sized intermittent fillet welds closely spaced to continuous fillet welds of reduced size. It also has been found that automatic welding is efficient and economical only in sub-assembly work. Another experience in welding is reported on page 56.

A Continuous Task

Events in Europe may be pushing the end of the war further off, but the task of postwar preparations will have to go on, just the same, and the cities in the Pacific Northwest are taking the job very seriously. Portland is adding to its postwar staff (pages 47-49) and also from that city comes the interesting news that aluminum is now being used for irrigation pipe.

Basic Labor Policy

Because the "basic steel" decision of the National War Labor Board of November 25, 1944 can be expected to become national wage policy for industry in general, the San Francisco Employers' Council have issued an illuminating analysis of the decision and its implications (pages 62-63), covering the general wage adjustment situation, military severance pay, guaranteed annual wage, vacations, dismissal or severance pay, sick leave, night shift differentials, holidays, geographical wage differentials, maintenance of membership and check-off.



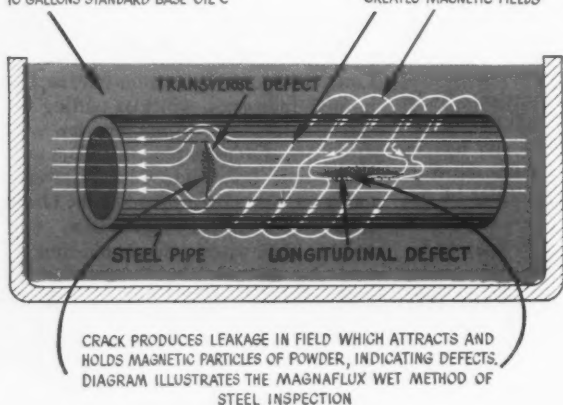
STANDARD ENGINEERS NOTEBOOK

VOL. 3-W No. 1

Water-white oil for the Magnaflux inspection of steel parts

BATH OF OIL AND
MAGNAFLUX POWDER.
1 TO 2½ POUNDS OF POWDER TO
10 GALLONS STANDARD BASE OIL C

APPLICATION OF LONGITUDINAL
ELECTRIC CURRENT AND
CIRCULAR ELECTRIC CURRENT
CREATES MAGNETIC FIELDS



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It is used in both the continuous system—the part magnetized while immersed—and the residual system—the bath flowed over the part after magnetizing. Standard Base Oil C is a clear, neutral oil so completely refined that it is water-white in color. All objectionable odors have been removed. It is uniform and always the same.

With all residues removed, Standard Base Oil C does not leave an oily film on parts. It evaporates readily, leaving a distinct powder pattern at defects. A minimum amount of mixing is necessary to suspend either black Magnaflux Paste No. 7 or red Paste No. 9 in Standard Base Oil C. Most operators use 10 gallons with one to two and a half pounds of paste.

Medium-volatility solvent for general metal cleaning

Standard Thinner No. 325 has solved for many operators the problem of efficiently cleaning machinery, motors and metal parts of all types. It is water-white—a straight run, uncompounded product made from the heart-cut of selected crude stocks—and has an economical evaporation rate.

It is especially suitable for cleaning precision parts where slow final evaporation retards production. Standard Thinner No. 325 has a faster final dry than most solvents generally used for this purpose, yet is as safe as slower drying solvents since its flash point is over 100°F. Standard Thinner No. 325 is but one of a complete line of petroleum solvents meeting the specific needs of practically every industry.

Stocks are limited today. So it is doubly important to select the correct solvent for each application to obtain maximum efficiency and conserve supplies.

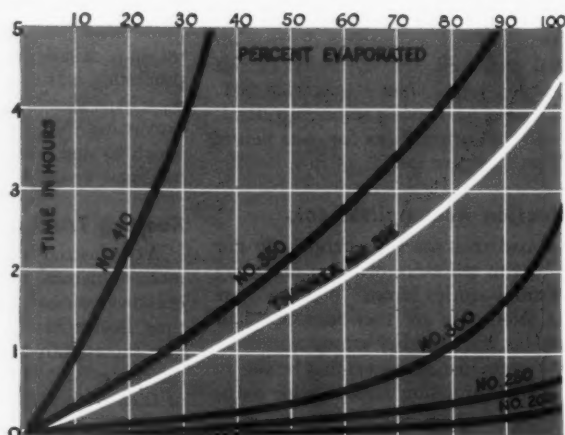


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STANDARD OF CALIFORNIA

CONGRESSIONAL SITUATION ENDANGERS WEST'S FUTURE

**Prompt Action Vital to Break East and South's Grip on Key Committees
Which Make the Decisions that Will Shape West's Industrial Destiny**

(As outlined to Western Industry by William G. Herron)

THE WEST is in imminent danger of locking its barn door after its best horse has been stolen. Right now the West as a whole doesn't know that the horse has any particular value, although here and there a few people realize it.

But a few months from now, unless prompt and vigorous action is taken beforehand, the West will eye the empty stable sadly when the big things come up for decision at Washington that most vitally affect the West's future, such as the disposal of the big war plants, the light metal and steel questions, the merchant marine policy, the Far East export situation, the Colorado River treaty with Mexico.

The name of this horse is Influence In Congress. It is entitled to such a name, because a few senators and congressmen can

do more in five minutes to change the future life of both Western industry collectively and its individual business enterprises than industry can do for itself in years.

Although most industrialists in the West are unaware of any danger, a few leaders in industry and some of the managers of the chambers of Commerce are alert and active. A general awakening would add great momentum to the efforts they have already initiated.

With Congress resides power to levy or remove destructive or burdensome taxes, to provide for disposal of steel mills, aluminum and magnesium factories, shipyards and aircraft assembly plants, to approve or disapprove economic deals with other countries that the White House or the

State Department have engineered. This power can nullify overnight the individual planning by private industry for either its present situation or its postwar outlook.

Industry is prone to say to itself, "the election is over, thank heaven. Now we can attend to our own business and forget politics and politicians for another four years."

"Right here is where industry makes its big mistake. These neglected local, state, and national political leaders of both parties are more important to it than the board of directors who decide company policy, the banks that lend them money or the individual firms or small groups that dominate single industries.

These politicians are actually a part of business, because the federal administra-

*** The Rules Committee, which cracks the whip over the House, is an all-eastern huddle, but there are two chances to break in right now, with two vacancies, Democratic in Texas and Republican in New York, to be filled. Will the West seize this golden opportunity?**





• **HOUSE WAYS AND MEANS COMMITTEE.** Over half the country not represented. California's two men have to do the whole job for the other ten Western states.

Members ranked in order of seniority in each party

DEMOCRATS

No. Carolina (Doughton, ch.)
Tennessee (Cooper)
Michigan (Dingell)
Virginia (Robertson)
Texas (West)
Kentucky (Gregory)
Georgia (Camp)
New York (Lynch)

REPUBLICANS

Rhode Island (Forand)
Wisconsin (Wasieleski)
Louisiana (Maloney)
Pennsylvania (Eberharter)
California (King)
Minnesota (Knutson)
New York (Reed)
Michigan (Woodruff)

VACANCIES

Ohio (Jenkins)
California (Gearhart)
Kansas (Carlson)
Pennsylvania (Simpson)
New Jersey (Keane)
Oklahoma (Dem.)
Massachusetts (Rep.)
Illinois (Rep.)

tion, with its many departments and agencies, is the dominating influence in business today. The war has made it the outstanding financial and economic power of the country, and the members of Congress, far more than the President himself, are the connecting link between this centralized authority and the grass roots of local business and industry. Their votes decide whether or not private industry may get a fair break, and what is of more importance to the West, whether the voice of the West will be heard in Washington.

But why is the West's most valuable horse about to be stolen just now, any more than at any other time? First of all, the 78th Congress which has shouldered the war burden expired the end of the year, and early in January the 79th Congress, which will have the task of preparing for peace, will meet for the first time and reorganize its committees by filling vacancies caused by defeat or retirement.

Right there in the reorganization of committees is the answer, but to understand its significance an explanation of the congressional system is required.

To begin the explanation, the fact which nearly everyone knows in a vague sort of way must be reiterated, that the real work of Congress is done by its committees. Consequently the only way for the West to protect its future is to see that the eleven Western states are adequately represented on committees important to the Western economy. But what do we find by examination of these committees, of which the most



• **HOUSE APPROPRIATIONS COMMITTEE.** The eleven Western states have four out of 43 members, and may lose one of these. East and South both fixed up nicely.

DEMOCRATS
Missouri (Cannon, ch.)
Virginia (Woodrum)
Indiana (Ludlow)
Georgia (Tarver)
Oklahoma (Johnson)
Pennsylvania (Snyder)
Kentucky (O'Neal)
Michigan (Rabaut)
North Carolina (Kerr)
Texas (Mahon)
California (Sheppard)
South Carolina (Hare)
Texas (Thomas)
Florida (Hendricks)
Ohio (Kirwan)

Washington (Coffee)*
Arkansas (Norell)
Tennessee (Gore)
New Mexico (Anderson)
Mississippi (Whitten)
Illinois (O'Brien)
Massachusetts (Curley)
REPUBLICANS
New York (Taber)
Mass. (Wiggleworth)
New Jersey (Powers)
Vermont (Plumley)
Illinois (Dirksen)
Michigan (Engel)
Nebraska (Stefan)

South Dakota (Case)
Wisconsin (Keefe)
Indiana (Johnson)
Ohio (Jones)
Iowa (Jensen)
Minnesota (Anderson)
Idaho (Dworshak)
Missouri (Ploeser)
Pennsylvania (Tibbott)
VACANCIES
New York (Dem.)
Alabama (Dem.)
New Jersey (Dem.)
Kansas (Rep.)
California (Rep.)

*May be appointed U. S. Senator to fill Wallgren vacancy.

important three of the House of Representatives are typical? Here are the facts:

Committee on Rules. As dominating in the House as Franklin Roosevelt and Harry Hopkins are at the White House, yet only one state west of the Mississippi is represented. This state is Missouri. A solid block of 22 states, covering two-thirds of the area of the United States, are not represented!

Ways and Means. Raises the money, so it initiates the entire tax program. Only six members from west of the Mississippi out of a total of 25 to represent two-thirds of the total area of the United States. Of these six, two members from California must represent all the eleven Western states, as the other ten have no one on the committee. Taxation without representation!

Appropriations. Recommends where and how the government's money will be spent. Out of 43 members, the Far West has only three, just having lost two in the November election.

And on the important committee of Banking and Currency, which passes upon legislation involving our banks and financial policies affecting our entire future development, out of 26 members only one from the Far West carries over to the new Congress, with three vacancies to be filled.



How to Get the Recognition and Support From Congress to Which the West is Entitled

The usual unintelligent procedure

1. Flood Congress with last-minute telegrams.
2. Make long-distance calls to your congressman at midnight just before the final vote is to be taken.
3. Rush one or several men to Washington by plane just as a committee gets through considering a bill.
4. Send telegrams asking congressmen to vote "yes" or "no" without telling them the reasons why they should do so.
5. Hurry-up pleas to organizations to pass resolutions.
6. Implore people to send long airmail letters at the eleventh hour.
7. Elaborate public presentations before a committee without ever trying to educate the individual committeemen in advance.

The logical direct steps

1. Recognize the importance of the committee set-up.
2. Get Western men on the key committees.
3. Get acquainted with the highest available local officials of each political party, including the state chairman, secretary and treasurer.
4. Familiarize all these people with Western industrial problems.
5. Maintain steady contact with your representatives in Congress. See them whenever they are at home. Keep in touch with them by mail in Washington.
6. Arrange to receive copies of pending legislation while it is still in committee, so that you can tell them your story in time.
7. Don't try to get your congressmen to get contracts or priorities for you, or otherwise expect them to act as agents for your individual business. They have to serve their district as a whole, and their function is legislation.

Only close students of congressional operations realize how closely the various committees control the bills under consideration and how in the House of Representatives the Rules Committee in turn controls the final action of all the other committees.

First of all, when a member introduces a bill it is assigned to the appropriate committee for study and action. Unless the chairman or the majority of committee members agree it shall receive consideration, it may die in committee. If they decide to permit it to die, it cannot be considered for passage unless 218 members of the House, a majority of the 435 members, petition that the committee be discharged and the bill be presented to the floor for action.

If the committee, however, decides to consider the measure, it may refer the matter to its appropriate sub-committee, which may hold hearings and recommend passage by the full committee. The latter may thereupon decide to hold hearings of its own, after which it may decide to recommend passage by the House.

The bill is then placed on the general calendar, where it remains until the Rules Committee decides it shall be presented to the floor. The decision of the majority members of the Rules Committee in this regard is greatly influenced by the Steering Committee and the leadership of the majority party. They in turn may be greatly influenced by administration policy, provided the administration is of the same party as the majority.

Therefore, the Rules Committee members may be subject both to the influence of their local constituents and national party policy at the same time. If the above-mentioned bill, in the opinion of the Rules Committee, should be permitted to die on the calendar, it will die despite the favorable report recommending passage from

the committee which had been assigned to investigate the measure.

In the Senate the Rules Committee is not as important as in the House of Representatives, because the Senate has no limitations on debate and consequently any Senator can be sure of an opportunity to make himself heard pro or con any matter. In the House, however, he may never have a chance if he is not a member of the committee to which such a measure has been assigned, or cannot arrange in advance with the floor manager of the bill for a portion of the time allocated to his party for debate.

The House, having more than four times the number of Senators, must conduct its affairs much more rigidly in order to afford its members an opportunity to participate. This necessity, therefore, places great responsibility on the Rules Committee and enhances its importance accordingly.

For this reason, of all the committees, particularly in the House, the Rules Committee through whom all proposed legislation normally must be funneled to the floor, should be most nearly representative

RULES COMMITTEE SET-UP

DEMOCRATS	Kentucky (Bates)
Illinois (Sabath, ch.)	Missouri (Slaughter)
Georgia (Cox)	REPUBLICANS
Virginia (Smith)	Illinois (Allen)
No. Carolina (Clark)	Michigan (Michener)
New York (Delaney)	Indiana (Halleck)
Mississippi (Colmer)	Ohio (Brown)

fore the committees. The committee hearings are public and are valuable in insuring that both sides of each question are presented. The fact remains, however, that a committee decision may be based on majority party policy or simply on which side can line up the most votes regardless of the equities presented at the public hearings.

All this is not such a reprehensible practice as it may sound. It is comparable to various types of reciprocity that prevail in private business. The point to be remembered is that since this is the way Congress operates, the West should see to it that the West has sufficient representation on important committees to insure that the interests of the West are adequately and effectively represented when the final votes are taken.

Because the field is so wide, covering the entire range of social and economic activity permitted by the constitution, it is impossible for any member of Congress to obtain all the knowledge necessary to pass intelligently on every matter before him. For example, members from interior states must rely largely in regard to naval affairs on the recommendations of members from maritime states who are close to the subject and in whom they have confidence. The converse would be true in regard to many agricultural matters.

Men in Washington who are familiar with the congressional picture are appalled when they discover how little most business men seem to know or care about the people who represent them in the national legislature. Some industrial groups with many millions of dollars at stake seem to have absolutely no comprehension of the fact that legitimate and intelligent education of their representatives in Congress, in order to acquaint them with the problems of industry, may pay off in most remarkable fashion.

*** Building fishing boats on the "production line" basis. Scene at steel ship division of United Concrete Pipe Corporation, Long Beach, Calif. In the foreground is a deckhouse which has arrived from the prefabrication plant at Baldwin Park, 35 miles inland. The tuna clippers, which are of all-steel construction except for wooden joiner work in the deckhouses, cork insulation in the hold and spun glass insulation in the crew's quarters, are prefabricated in six sections with the piping installed and moved on trailers to the shipyard as needed and assembled as soon as they arrive. Upon completion a ship is moved from the building slab onto the marine railway and then taken to the launching carriage which lowers it into the water slowly without risk of damage.**



*** Feed end of paper sheeting machine at Fernstrom Paper Mills, Inc., at Pomona, Calif., showing 25 rolls being cut simultaneously with continuous feed for wrapping tissue, fruit wrappers, etc. Revolving knives and slitters cut the sheets to the required sizes.**

Industrial groups can profit by employing the most intelligent representation available to work with the members of their delegation on Western problems. This in no sense suggests a lobbyist; instead it is a matter of making available to the congressmen on the ground as much accurate and up-to-date information as possible. The more that the representative knows about his employer's operations and problems the better.

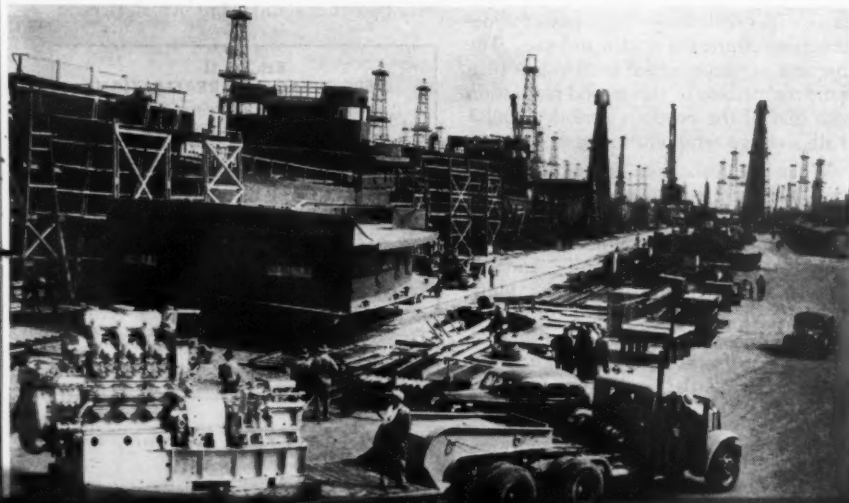
But above all, the first thing that should be done is to take a list of all the men in Congress from the West, see what committees they are serving on and ascertain whether they are placed where they can do the economy of the West the most good. If they are not advantageously placed,

they should be encouraged to move to committees that relate most closely to the principal activities of their area. The second step to be taken is to look over the new men in Congress from the West, and acquaint them with the business problems of their district before they leave for Washington and as often as they return. At the same time they should be urged to aspire to the right committees and be supported in their efforts to obtain these posts, instead of letting the leaders in the Senate and House assign them to lesser committees.

It is especially important not to overlook these new members, because once they receive their committee assignments their tendency is to stay put in order to get seniority right where they are. After a man is near the top of an unimportant committee it is frequently difficult to get him to step down to an important committee because it involves giving up the seniority that it may have taken many years to acquire.

Industrialists are also prone to believe that these men cannot be profitably informed when they are of the opposite political faith, forgetting that these politicians must be interested first of all in the welfare of their home districts in order to build up support for reelection.

A recent example is that of a newly-elected congressman from the West, who was considered by a certain industry to have communistic leanings. Investigation developed the fact that his so-called communism was confined entirely to an interest in seeing that workers in that industry got decent working conditions. Beyond that he actually had a deep appreciation of the importance of the industry and a desire to serve it. An active effort to get him placed on the appropriate committee would have been invaluable.



Incentives for Supervisors Create Cost Consciousness

THE subject, "Incentives for Supervisors," opens a tremendously wide field for discussion. Rather than delve into the realm of theory and values, illustrations and references will be restricted to the supervision incentive plan which is at present being operated successfully by the Consolidated Vultee Aircraft Corporation.

Its purpose is to establish cost controls which encourage maximum utilization of facilities.

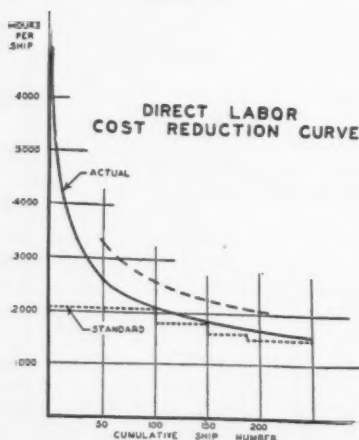
Tools employed consist of simple, practical measuring sticks and psychologically created cost consciousness. Considering the fast expansion of aircraft manufacturing and the rapid upgrading of personnel to the ranks of supervision, this creating of a cost consciousness is a major objective in itself. Supervisors at Consolidated Vultee are considered as managers of their own businesses and the organization is functional, so far as possible, providing distinct responsibilities which may be individually controlled.

The following phases of this discussion will cover separately: measurements for direct labor, measurements for controllable indirect expenses, and the formula or use of the measuring sticks in rewarding supervision's effort.

Measurements for Direct Labor

Peculiarities inherent in the production of aircraft have given rise to the belief that direct labor standards could not be practically applied. Rushing models into production before good tooling is available, along with the deluge of engineering changes which flood the shop, certainly create unstandard conditions. Nevertheless, units of measurement have been effectively and economically used.

Exhibit I



By B. C. HAWK and J. E. MARTIN
Industrial Engineers
Vultee Field Division, Consolidated Vultee
Aircraft Corporation

Exhibit I is a typical cost reduction curve showing direct labor hours per unit. The curve illustrated by the solid line is based on the average trend of unit costs, in relation to the cumulative quantity, as experienced by the aircraft industry at large. The lighter dash line is a similar example, initiated at a higher level. The practically horizontal dotted line, shows the standard hours as they would appear if established and controlled under the plan to be described.

In view of the fact that the trend of actual costs is so radical, it appears that absolute or ideal standards would be difficult to establish. Nevertheless, a conscientious effort is made and standards are set on operations when parts are first released for production. Machine paced operations are relatively simple to cover, in most instances synthetic standard tables are used. Assembly operations are given a careful but speedy analysis. Here, then, are the standards which may be put to effective use.

The second step, as in any incentive program, is to provide an accurate count of production accomplishment. Inspection has been delegated this responsibility, as a by-product of quality assurance. Forms are provided to facilitate the count and standardize the reporting procedure.

Bringing together the count of production and the operation standards is illustrated in the sample calculation, Exhibit II. The number of parts produced is multiplied by the standard to arrive at standard hours of production. The actual time expended during the period of production is compared to the productive output and the realization percentage of standard is calculated. This realization is the basis for determining effort; but not the measure. The true unit of measurement used in this plan is the comparison of this period realization with that of the previous period. Exhibit II illustrates a ten-point increase.

When the realization on standards approaches one-hundred percent, as illustrated in the cost reduction curve (Exhibit I), at cumulative ship number 100, then operations are re-studied and standards are re-established as indicated at ship number 101. The previous period realization percentage is adjusted, at the time of standards changes, in direct ratio to the change in standards; therefore, no penalty

Exhibit IV

CONSOLIDATED VULTEE AIRCRAFT CORPORATION					
VULTEE FIELD DIVISION					
BUDGET IV					
DIRECT MANUFACTURING EXPENSE					
VARIABLE BUDGET					
CLASS OF EXPENSE	STANDARD	ACTUAL	VARIANCE	PERCENTAGE	REMARKS
Indirect Labor:					
Supervision	800	x	100	25.00	8/8 (A)
Clerical	800	x	40	5.00	8/8 (A)
Skips	800	x	130	16.25	8/8 (A)
Other Indirect	800	x	0	0.00	8/8 (A)
Indirect Expenses:					
Operating Supplies	811	x	0	10.00	8/8 (B)
Perishable (Wear) Tools	811	x	0	25.00	8/8 (B)
Assigned Indirect Labor:					
Inspection	275-800	x	480	108.80	8/8 (B)
Production Control	275-800	x	118	26.00	8/8 (B)
Shipping	280-800	x	0	7.67	8/8 (C)
Maintenance	284-800	x	482	17.00	8/8 (A)
(A) Actual Total Utilized Direct Labor as shown on this Department's Operating Report.					
(B) Standard Total Utilized Direct Labor as shown on this Department's Operating Report.					
(C) Actual Total Utilized Direct Labor, Utilized Labor and Indirect Labor as shown on this Department's Operating Report.					
TOTAL LABOR					
TOTAL OTHER					
TOTAL CONTROLLABLE EXPENSE					

is incurred when making a comparison between two periods.

Add the magic touch of an incentive to the supervisor and cost consciousness is created. With cost consciousness of supervision comes utilization of facilities. Referring to the direct labor cost reduction curve for an illustration again, the trend of industry average follows the slope shown. However, the level is dependent on the degree of control exercised by management.

Indirect Labor and Expense Control

In the control of indirect labor and other indirect assignable costs, special features of operating control are used. In some instances, where the department being surveyed is engaged in direct production or is closely related to one which is producing, direct labor is used as a base for proper control of expense. This direct labor base may be either standard or actual, depend-

Exhibit II
PERCENTAGE OF REALIZATION

Part No.	Point Increase		
	Standard Hours per Part	Number of Parts Produced	Standard Hours of Produc'n
79-64005-0	2.45	65	159
79-66014	8.39	59	495
79-78109-1	1.02	73	74
79-78177-3	12.36	65	803
79-95173	.78	60	47
Total standard hours of produc'n			1,578
Total actual hours expended			2,100
% realization (this period)			75
% realization (previous period)			65
Point increase			10

ing on the nature of expense and how it is incurred.

When setting standards for indirect departments not closely related to production, it is usually far more practical to choose a base which shall more accurately gage the effort and indicate efficiency of the department. As a result of making a comprehensive study of the department, we might decide to use tons hauled, miles traveled, parts scheduled or even a combination of two or more bases. For our purpose, such a method of setting standards for indirect items is adequate since, as was explained under the heading of direct labor, our incentive plan is operated fundamentally on comparison of realization percentage between periods.

We use a variable budget in setting standards for indirect expense and the result is in some cases a straight variable while in others a combination of variable and constant, depending on conditions and the result we wish to obtain.

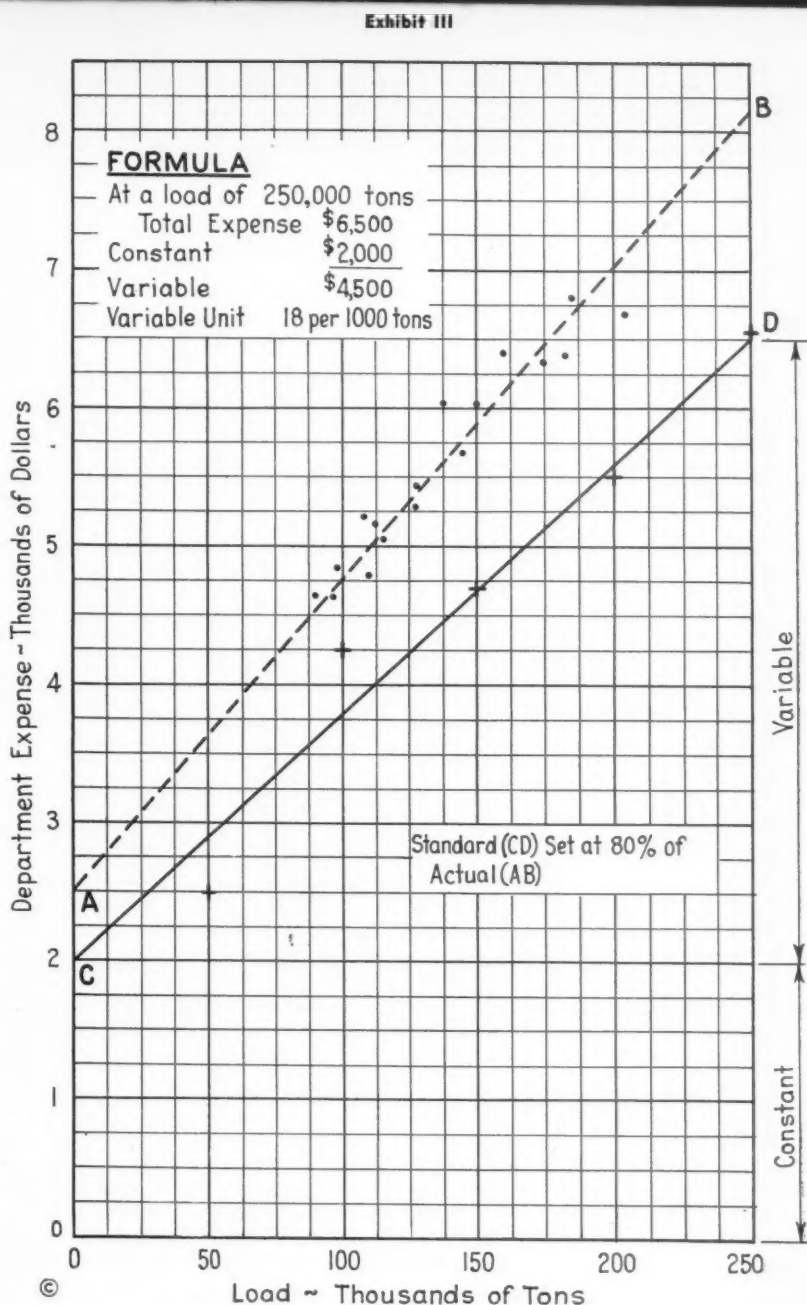
In setting these standards, a chart similar to Exhibit III is used. As will be noted by the dots, estimated required expense is plotted on the chart at various loads. As stated before, this load can be on the basis of direct labor, parts scheduled, etc. This example indicates tons. Slope of the curve is determined by these dots and where it meets the zero load, the constant is established.

It is well also to plot past history on this chart, arriving at the average expense as related to load and checking the standard to establish a proper incentive. Once satisfied that the curve is reasonable, a point is chosen on the curve noting the expense necessary at a given load. The constant is deducted from the total expense and the resulting figure divided by the load to determine the variable.

Such a chart is prepared for each type of expense, in a department and the formulas resulting therefrom are summarized on a form similar to Exhibit IV. The formulas must be accepted by supervision affected and the standards must be proven before being used.

Application of these standards is a function of the Accounting Department. Base references are noted on this sheet advising the Accounting Department of the source as well as furnishing instructions for computation. By referring to these formulas, it is relatively simple to extend the reported units of measurement for the period by the variable and add the constant, if one is indicated.

Since initiation of the Direct Operating Report, Exhibit V, some years ago, Consolidated Vultee has always been able to obtain actual expense for direct departments, but the control of expense for indirect departments presented a seemingly difficult problem. Within this past year, however, the company has revised its ac-



counting system and standardized its departmental organization structure, with sub-divisions for functional control, which permits preparation of comprehensive Operating Reports for indirect departments also.

At Vultee Field reports are made by department, and set standards for, only those expenses controllable by the department. A minor exception to this statement is the item of Assigned Indirect Labor shown on Exhibit V which is composed of Inspection, Production Control, Timekeeping, and Maintenance. We have a dual control in handling expense of this nature in that each department charged is watching the

realization and furnishes a check against the indirect department which is primarily responsible.

Although each item on the report is controlled by its own realization percentage, determined in the same manner as direct labor, the figure that actually controls the pay-off is the total realization for the department. This is determined by dividing total actual dollars into total standard dollars.

Calculation of Incentive

The incentive is calculated on a monthly basis. The month is composed of four or five weeks, depending on the pay periods

DIRECT DEPARTMENT OPERATING REPORT

Dept. No. _____

Dept. Name _____

Building No. _____

Plant No. _____

Department Head _____

Period _____

Week 5

W. E. 11-30-44

CLASSIFICATION	AMOUNT IN DOLLARS			PERCENT REALIZATION		
	Standard	Actual	Variance	This Week	Period To Date	Previous Period
DIRECT LABOR ON STANDARDS						
Model— A	495	884	385	56	60	56
Model— B	3034	3522	488	86	84	80
Model— C	7	4	3	175	135	76
Model—						
Model—						
Model—						
Miscellaneous						
Total	3540	4410	870	80	79	76
DIRECT LABOR Not on Standards						
Productive		2				
Tooling		35				
Total	30	37	7	80	80	83
TOTAL UTILIZED DIRECT LABOR	3570	4447	877	80.3	79.4	76.0
UNUTILIZED LABOR						
Training		7				
Overtime Premium		641				
Night Shift Premium		60				
Extra Work		—				
Rework		21				
Idle Time		8				
Rate Variations						
Total	590	737	147	80.1	78.7	76.3
INDIRECT LABOR						
Supervision	340	525	185	65	55	49
Clerical	32	8	24	400	99	72
Sweepers	56	96	40	58	63	73
Other Indirect						
Total	428	629	201	68	58	51
INDIRECT EXPENSE						
Operating Supplies	43	50	7	86	114	161
Maintenance Supplies						
Perishable Tools (Broken)	100	17	83	588	123	92
Total	143	67	76	213	120	106
ASSIGNED INDIRECT LABOR						
Inspection	204	139	65	147	148	76
Production Control	142	112	30	127	105	67
Timekeeping	44	81	37	54	72	78
Maintenance	108	191	83	57	78	79
Total	498	523	25	95	105	74
TOTAL DEPT. LABOR AND CONTROLLABLE EXPENSE	5229	6403	1174	81.7	79.4	73.7
FACTORY AVERAGE PERCENT REALIZATION				66.21	71.1	72.5

Issued by _____

Data issued _____

falling within the month. Exhibit VI is an example of the worksheet used. The realization percentages for the two months are obtained from the Operating Control Reports of the various departments. In addition, the worksheet also shows weighted percentages for the departments

indicated. These latter percentages can be termed "Plant Average."

Comparison results in a plus or minus number of points, indicating that the department has improved or dropped below the realization for the preceding month.

A premium is paid if a department main-

tains its realization. In maintaining, the realization for the current month can drop no lower than three points below that of the previous month. The premium paid on plant average is a flat five percent and the current month's realization can drop no lower than two points below the preceding month. In calculating the premium for individual departments, the range is limited to a minimum of four and a maximum of ten percent.

A premium is paid if a department improves its realization. One-half of one percent is allowed for each point of improvement with no limit being set. Improvement is self-evident by use of the plus symbols.

All departments participate in the plant average which is calculated in the following manner: As stated before, a flat five percent is allowed for maintaining this realization. In addition thereto, one-half of one percent is allowed for each point of improvement. These two premiums are added together and applied to each department. Occasionally this plant average is the only premium received by the department, when the department's own realization has fallen below the permitted three points.

Two additional factors enter into the calculation at this point, one is for housekeeping and the other for safety. Housekeeping is a penalty only while safety can result in either a penalty or a premium, depending on the increase or decrease in ratios of accidents and lost time cases to man hours.

Supervision, other than the general foreman or department head and his superiors, is paid on the individual department's performance which is determined by addition of the percentages for maintaining, improving and plant average, adjusted by the housekeeping and safety factors. Top supervision receives the arithmetical average of all departments, direct and indirect.

In conclusion, we have presented here a plan which has been proven. Results are self-evident in controlling cost by rewarding effort.

Exhibit VI.
SUPERVISORY COST CONVERSION INCENTIVE PAYMENT FOR DECEMBER, 1944

Department Operating Reports for			Points Difference	% For Maintaining	% For Improving	% For Total Prod. Depts.	Total Percentage	Housekeeping Rating	From Table	SAFETY						Total Incentive Percentage	
Dept. No.	Last Month	This Month								Frequency			Severity			Last Month	This Month
A	81.5	82.7	+1.2	8.15	.60	6.10	14.85	97%	0	16.22	-1	1.622	-1	20.4	12.9		
B	74.0	75.8	+1.8	7.40	.90	6.10	14.40	98%	0	0	0	0	0	16.9	14.4		
C	75.9	77.8	+1.9	7.59	.95	6.10	14.64	93%	0	0	0	0	0	16.7	14.6		
D	74.8	87.9	+13.1	7.48	6.55	6.10	20.13	93%	0	0	0	0	0	9.3	20.1		
E	90.0	97.3	+7.3	9.00	3.65	6.10	18.75	92%	0	13.56	-1	.135	-1	21.4	16.8		
F	76.7	84.4	+7.7	7.67	3.85	6.10	17.62	93%	0	0	0	0	0	23.0	17.6		
G	51.8	48.4	-3.4	5.18	0	6.10	6.10	92%	0	62.33	-1	2.460	.581	+1	12.6	6.1	
H	80.3	77.7	-2.6	8.03	0	6.10	14.13	95%	0	0	0	0	0	18.2	14.1		
I	78.0	81.2	+3.2	7.80	1.60	6.10	15.50	91%	0	19.00	15.45	+1	.627	.231	+1	13.4	17.5
J	69.4	70.6	+1.2	6.94	.60	6.10	13.64	95%	0	22.75	20.95	+1	.045	.880	-1	16.0	13.6
K	71.2	68.4	-2.8	7.12	0	6.10	13.22	93%	0	0	0	0	0	17.8	13.2		
L	82.8	88.6	+5.8	8.28	2.90	6.10	17.28	95%	0	0	0	0	0	21.7	17.3		
M	66.8	70.5	+3.7	6.68	1.85	6.10	14.63	93%	0	0	0	0	0	9.3	14.6		
Total	75.8	78.0	+2.2	5.00	1.10	6.10											



• Some of the high-speed Acme-Gridley four and six-speed automatic screw machines tooled up to produce special jobs.

SPEED-UP—Records on Screw Machines

PACIFIC SCREW Products Corporation of South Gate, California, have been able to obtain unusual results in a number of war items through two things. First of these is careful study of the possibilities in tooling and high speed operation of equipment; the second a family-type personnel policy that has welded the employees into a cooperative production team.

Perhaps the best known of these accomplishments is the turning out of $3\frac{1}{2}$ million sleeves a month on seven RA-6 Acme-Gridleys. It resulted from a meeting of various Western screw products manufacturers in February 1943, called by the Army Air Forces, Western Procurement District, to establish Pacific Coast sources for Parker type fittings on account of the increased demand for aircraft.

This sleeve is made from Duronze, or what is better known as copper silicon bronze, a rather tough material to machine, therefore requiring a special high-speed tooling in order to accomplish maximum production. When James W. Compas, president of Pacific Screw Products, told the Army Air Force that he could produce a million sleeves a month the officers didn't exactly "laugh when he sat down at the piano", but his assertion sounded more like a brag than a promise.

In two months, however, the $3\frac{1}{2}$ million sleeves were rolling out. It required stepping up the output of each machine

from 2,000 a day to 20,000 or one sleeve every 3.2 seconds. This involved doing eleven operations, including all the machining of both the inside and outside of the sleeve and an identification stamping.

The sleeve job was one of the major factors taken into consideration in the Award of the Army-Navy "E" flag. Pacific is one of the few strictly parts manufacturing plants to receive this award.

Another accomplishment was the manufacture of special nut blanks for Firestone Tire and Rubber Company, who were subcontractors for General Motors Corporation when the Los Angeles plant of G-M was engaged in the medium tank program in 1943.

Production requirements were beyond the tapping capacity Pacific had at that time. In order to overcome this obstacle, a large single-spindle tapping machine was converted to a 2-spindle tapping machine. By proper gearing this increased the capacity of this machine from its normal 500 an hour to approximately 1500, thereby eliminating a bottleneck on the nut blanks.

When the Western Procurement District made a survey of the southern California area, covering some 29 plants, for a source for Aero-Couplings, they were unable to find anyone to accept the contract for making parts for this critically needed assembly. Then Aero-Coupling Corporation and the Army Air Force jointly called upon

Pacific Screw Products to produce these parts in large quantities almost immediately.

After some discussion regarding delivery dates, the Compas Brothers took on this very tough job. Tolerances were closer than any job that Pacific Screw Products has ever attempted in large quantities, but the very first part which came off the machine was almost perfect. The machine operator was actually considerably put out because it wasn't exactly as per blueprint. Production then was stepped up, delivery requirements were met and another critical shortage eliminated.

Pacific was then called upon by the Navy Department through their prime contractors to produce "Bogie Wheels" for the amphibious tanks. This part is not too difficult to make by virtue of its design, but the material it is made from is difficult to machine. Again, by ingenious tooling and hard work, Pacific Screw Products made ample quantities of these to meet the Navy requirements.

The Compas organization was called upon to produce large numbers of threaded parts for both the Army and Navy. In order to produce them in large quantities they had the choice of procuring additional second operation equipment or doing them in the old fashioned way on turret and other types of lathes. Again, by skillful tooling they were able to adapt primary

machines, both 6-spindle Acme-Gridleys and single-spindle Brown and Sharps, to second operation work, thereby increasing production over the old turret lathe method approximately 600 per cent.

All this production has been achieved with a very low percentage of rejections and scraps. A sample monthly report showed the percentage of rejections by contractor's inspection to be .016, by AAF inspection to be .006 and the percentage of scrap, excluding trimmings, shavings and other non-usable material, was .0039.

Carbide-tipped tools were an essential for the high-speed operations, and were good for seven days and nights of use, where the highest speed tool steels were only good for 15 to 30 minutes.

Instead of regarding bearings as "sacred cows" which must be kept intact at all costs, this organization has considered them entirely in the light of aids to volume production. Consequently bearings supposed to last years have been worn out in five or six months under the high speeds at which the equipment is driven. But a \$30 bearing replacement is only an infinitesimal fraction of the tremendously increased output made possible by the high speeds of the automatic machines.

To get accuracy, uniformity and finish of threaded parts, the plant has been equipped with a special air-condition gage room, where thread grinding can be carried on without the interference of vibration.

Obviously men and women, as well as

machines, have to operate intelligently and cooperatively, to get such production results as have been mentioned. Although the force numbers about 450, the workers are permitted to stroll out of the building at 9:30 in the morning for a 10-minute period, or they may enjoy free coffee and doughnuts in the cafeteria. A similar rest period is given at 3 o'clock in the afternoon. A full lunch of soup, meat, potatoes and other vegetables, bread, butter, dessert, coffee, tea, milk, is served in the cafeteria at meal times for 25 cents. This expense is considered a necessary cost element in getting big production.

Pacific's foremen have their own organization and thrash out production problems at monthly meetings. From these have re-zation and thrash out production problems but more efficient designs in toolings.

A birthday party is held each year to celebrate the founding of the company in 1929 by the two Compas brothers. Jim had years of experience with Ford and G-M, while Steve had banking and other business training, and they started with one machine and a few hundred dollars. The equipment now numbers over 350 pieces.

At Thanksgiving each employee gets a turkey, and at Christmas a gift, which under war conditions has been a war bond. New production records are celebrated with a banquet and entertainment at the company's expense. Every employee participates in a pension plan, the cost of which is paid by the company.

Probably the most appreciated activity sponsored by this progressive organization is the Group Insurance and Annuity and Pension Plan. The Group Insurance Plan is financed jointly by the company and the employee with premiums based on the monthly earnings of the individual. While it is not compulsory for the employee to participate in this plan, over 90 per cent are now carrying this added protection against sickness, accident and death. The Pension and Annuity Plan is financed entirely by the company at a cost of approximately \$90,000 yearly. Each employee, after serving with the company for a period of six months, is included in the plan, and the value of the Annuity is determined by the individual's monthly earnings.

Rheem Operations At Basic Magnesium, Inc.

About 850 of the remaining labor force at Basic Magnesium, Inc., at Las Vegas, Nevada, were put to work after the closing down of magnesium production on army and navy contracts for Rheem Manufacturing Co. The Army Ordnance job is to machine and finish 81-millimeter mortar shells drawn by Norris Stamping & Manufacturing Co. in Los Angeles, after which the shells will be shipped to arsenals elsewhere in the country for filling.

The navy contract is for rocket bodies. Both these contracts are expected to run through 1945, and the army and navy are supplying \$750,000 of equipment and facilities to carry on these operations. Shops and some of the other BMI facilities will be used, but the preparation and chlorination buildings will not be touched.

Decision to have this work done at Las Vegas was in the interest of conserving labor supply in the crowded coast area.

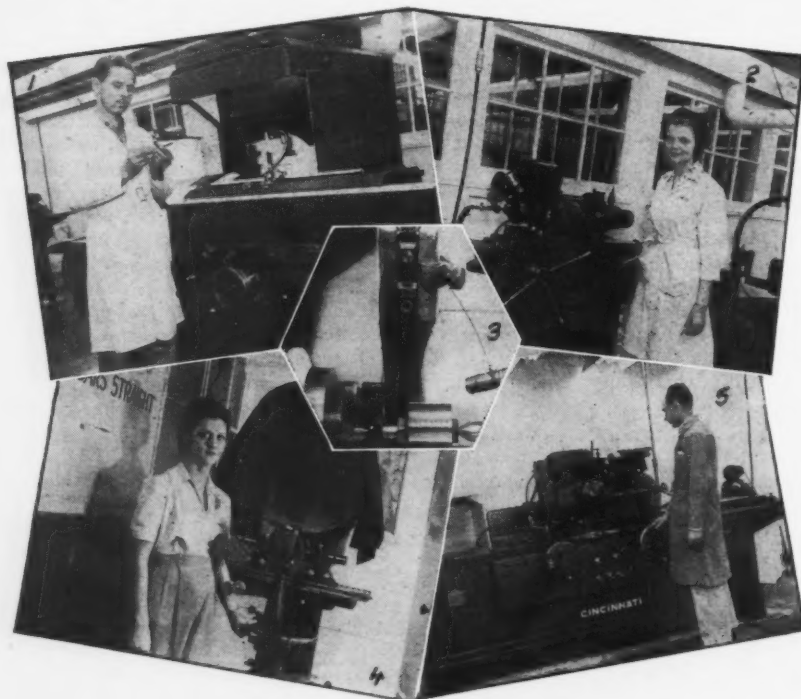
Western Lead Mines To Increase Output

Lead mines, which have had difficulty maintaining their labor forces in face of the competition from the stronger copper organizations, are now to get some help from WPB, which has promised them support in obtaining manpower and supplies.

The leading Western district to be thus affected will be the Coeur d'Alene district in Idaho, the richest lead area in the West. Others will be the lead mines in Colorado, Tintic, Park City, and Bingham Canyon in Utah, Pioche in Nevada and the Inyo County region in California.

Copper Discovery

The new Arizona copper deposit on which the Magma Copper Company has taken a purchase option and will begin development is reported to be a low grade proposition of the disseminated ore body type, running less than one per cent copper, but with possibilities of from 30,000,000 to 100,000,000 tons of paying ore in it. The ore body lies 46 miles northwest of Tucson, between the towns of Oracle and Mammoth.



* Tooling equipment scenes. (1) Raymond Fuher, grinding department foreman, checking thread gauge ground on precision thread grinder. (2) Operator Jerry Smith standing beside internal grinder. (3) Close-up view of 3-inch tap for turret lathes being ground on the precision thread grinder. (4) Gertrude Wade checks a small part on the comparator and measuring machine. (5) Jay Martin, tooling department chief, working on a 12-inch universal grinder. Gauge room is air-conditioned to control temperatures.



Courtesy Union Pacific Railroad Company

• Freight trains getting ready to go in the yards at Laramie, Wyoming, near the top of the continental divide.

RATE OUTLOOK—Future Possibilities

ON THE basis of present traffic movement, all western railroads could reduce their freight rates and still make money. How far they could go in this direction would be a different matter for each railroad.

Not all lines could reduce rates to the same extent. Since all lines are more or less competitive, the strong lines would reduce rates only to the extent that weak lines could sustain the resulting loss of revenue.

By "weak" lines we do not refer to operating efficiency, but rather to lines which, for one reason or another, have high fixed charges. The Santa Fe and Union Pacific have relatively low fixed charges, while the Southern Pacific and the Milwaukee have relatively high fixed charges. Fixed charges of the Great Northern and Northern Pacific are somewhat high, but not as high as those of the Southern Pacific and Milwaukee.

What are fixed charges? They are the interest which a railroad must pay on its bonded indebtedness. Outstanding bonds carry interest charges that must be paid,

By JAMES J. BROZ

Editor's Note: This is the third and concluding installment of an article on the Western freight rate situation, and Mr. Broz' name appears for the first time as the author. For the last three years he has been traffic manager for Basic Magnesium, Inc. at Las Vegas, Nevada, the plant which was the world's largest producer of magnesium until it was shut down along with other magnesium plants because of the surplus of this metal. Previously, Mr. Broz was with the California Railroad Commission as a rate expert, and he has had other traffic experience. With the closing of BMI, he has moved to Los Angeles to engage in the general practice of law, specializing in transportation and public utilities.

The first two installments of the article pointed out that the development of industry and manufacturing in the West had not proceeded to the point which would justify Western railroads in fixing freight rates in Mountain-Pacific territory on the same basis as now applies to the eastern part of the United States, although there is some question as to whether the railroads have sufficiently encouraged the new "war babies" which have grown up in the West. Lack of traffic density has been the main reason for higher rates in the West.

whether the stockholders receive dividends or not. Failure to meet interest payments threatens a railroad with receivership or reorganization proceedings.

Here, then, is one reason why western railroad rates cannot be drastically reduced now, or even in the postwar period. In order to maintain the interest payments on their bonds, certain railroads may not run the risk of reducing freight revenues, by reducing freight rates, because to do so would entail serious consequences.

The accompanying table shows the capital structure of the six railroads whose traffic statistics we have also reported. The element of fixed charges is based on the amount of outstanding bonds and relative strength or weakness is indicated by the amount of bonded indebtedness per mile of railroad.

During periods of high earnings, it is proper for a railroad to liquidate bonded indebtedness so as to reduce interest payments as much as possible. This has been done to a certain extent by the Southern

Pacific Company and other lines in recent years.

But the fact remains that the bonded indebtedness of our Western railroads is far too high, and as long as it continues to be so, our Western freight rates cannot be drastically reduced without affecting the ability of the roads to pay their interest charges.

Some lines like the Milwaukee and the Western Pacific went through reorganization under Section 77 of the Bankruptcy Act in 1935, but this is a drastic procedure which usually wipes out the equities of the common stockholders and, sometimes, preferred stockholders, while the equities of junior stockholders are generally reduced.

If present high railroad earnings continue for the next year or two, Western railroads may be in a position to shrink their funded debt down to more normal proportions, and thus reduce their fixed charges. By so doing, there may be a possibility of reducing freight rates in the Western district in the postwar era.

By way of a conclusion, the "Report on Interterritorial Freight Rates" issued by the Board of Investigation and Research set up under the Transportation Act of 1940, made certain general findings with respect to the level of freight rates within Mountain-Pacific territory as compared with rates in other districts of the United States.

We offer them, in an accompanying table, as a quick reference to certain basic commodity rates in order to show that Mountain-Pacific rates are higher than rates anywhere else in the country. Before doing so, it will be necessary to define certain geographical districts referred to, so that the comparisons may be understood.

In railroad parlance, the United States is divided into three general districts: EASTERN (sometimes called "Official Territory"), which includes all the states north of the Ohio and east of the Mississippi; SOUTHERN, which includes states south of the Ohio and east of the Mississippi, and WESTERN, which comprises all states west of the Mississippi River.

For traffic purposes, these are further subdivided as follows: EASTERN District includes "New England Territory" comprising the New England States "Trunk Line Territory," which includes New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia, and "Central Freight Association Territory" which comprises Ohio, Indiana, Michigan, and Illinois. WESTERN district includes "Western Trunk Line Territory" which comprises generally the states between the Mississippi River and Salt Lake City, north of and including Missouri, Kansas and Colorado, and "Southwestern Territory" which comprises the states of Arkansas, Louisiana, Oklahoma, Texas, and "Mountain-Pacific Territory" which comprises states west of Western Trunk Line territory.

The commodities on which we will summarize the comparative rates, on a percentage relationship, are cottonseed oil, fresh meats and packing house products, lime, livestock, lumber, plaster, bulk salt and package salt. For comparative pur-

poses, we will base the percentage relationships upon Eastern District, or Official Territory rates as 100 per cent. The accompanying percentages are taken from the government's report:

Such apparent discrimination in freight

WHEN TONNAGE IS AT CAPACITY,

Here are some interesting figures for western railroads, showing railroad revenues, expenses and taxes in pre-war years contrasted with the war years, showing how increased traffic reduces operating costs. If this be true of wartime operation, solely because of increased traffic, it should hold equally true of peacetime operation, provided the volume of domestic traffic is encouraged by a reduction in freight rates.

These tables show that while the Southern Pacific Company's revenues from both freight and passenger services in 1943 increased 194 per cent over the revenues earned in 1938, its operat-

Year	Southern Pacific Co. Pacific Lines	A.T.&S.F. System Lines	Union Pacific All Lines	Great Northern Railway	Northern Pacific Railroad	Chicago, Milwaukee, St. Paul & Pacific
TONS OF REVENUE FREIGHT HAULED						
1938	30,491,582	29,801,220	25,284,671	23,264,183	14,813,612	30,934,327
1939	33,687,664	31,053,547	26,453,735	32,821,757	17,129,031	33,841,422
1940	36,793,763	30,030,485	27,289,316	40,047,611	18,542,450	35,320,967
1941	48,227,019	38,907,016	33,824,223	50,381,028	21,877,168	42,907,270
1942	62,217,183	51,036,292	45,568,297	59,762,707	27,694,151	48,718,373
1943	68,154,979	57,711,140	53,707,020	58,920,877	20,290,205	53,824,310
Increase:						
1943 over 1938	124%	94%	112%	153%	37%	74%
FREIGHT SERVICE—OPERATING REVENUES						
1938	\$119,149,818	\$127,549,302	\$122,754,431	\$ 69,575,311	\$ 49,260,687	\$ 85,647,368
1939	133,055,162	131,252,736	135,076,147	82,234,211	56,461,394	92,794,893
1940	145,876,336	140,871,611	139,037,567	92,311,433	61,407,545	99,911,336
1941	189,163,281	185,127,258	180,272,442	110,505,561	74,289,243	117,246,205
1942	284,215,505	284,229,861	282,241,763	143,264,055	100,819,969	146,466,250
1943	328,341,829	333,838,283	357,590,629	166,429,112	119,842,721	174,018,632
Increase:						
1943 over 1938	176%	162%	191%	139%	143%	103%
PASSENGER SERVICE—OPERATING REVENUES						
1938	\$32,548,459	\$26,770,190	\$26,355,509	\$ 9,640,220	\$ 7,760,898	\$13,725,087
1939	33,567,932	28,783,458	28,059,110	9,549,162	7,421,039	14,006,700
1940	31,241,448	29,128,278	28,083,104	9,431,703	7,307,060	14,388,701
1941	26,501,019	22,786,021	21,554,471	4,866,328	4,447,358	9,646,900
1942	58,354,530	52,987,080	45,793,903	9,182,732	9,237,380	17,772,714
1943	98,836,662	103,803,803	86,742,472	18,853,552	18,780,575	31,010,174
Increase:						
1943 over 1938	204%	288%	225%	96%	142%	126%
TOTAL OPERATING REVENUES—INCLUDING FREIGHT & PASSENGER						
1938	\$158,263,994	\$154,323,227	\$150,213,214	\$ 79,215,531	\$57,021,585	\$ 99,436,846
1939	174,001,362	160,039,967	164,253,371	91,783,373	63,882,433	106,875,380
1940	186,272,243	170,003,639	168,164,258	101,743,146	68,714,635	114,375,589
1941	232,899,215	225,043,648	218,091,994	125,044,883	85,346,327	139,646,122
1942	370,469,054	361,148,930	353,064,543	165,206,031	119,310,556	179,867,280
1943	465,362,718	471,119,015	480,274,934	200,573,426	151,531,731	224,515,240
Increase:						
1943 over 1938	194%	205%	220%	153%	166%	126%
TOTAL OPERATING EXPENSES—INCLUDING FREIGHT & PASSENGER						
1938	\$124,611,743	\$120,412,014	\$105,731,151	\$ 54,517,108	\$47,056,728	\$80,673,187
1939	127,284,244	125,334,705	117,858,588	60,462,670	49,679,727	85,511,814
1940	135,442,960	129,656,637	120,949,111	65,901,723	51,615,264	87,170,144
1941	159,998,102	156,910,708	159,997,894	78,323,366	59,909,720	97,756,536
1942	220,192,351	198,327,167	199,039,130	93,318,476	77,229,103	115,963,264
1943	300,631,917	256,456,095	300,074,772	122,771,867	92,136,021	145,735,801
Increase:						
1943 over 1938	141%	113%	184%	125%	96%	81%

rate levels on traffic moving within Mountain-Pacific territory have been justified in the past by the low traffic density in the Mountain-Pacific area as compared with other districts. Other reasons were the predominant movement of low-rated agricul-

tural products, lumber and also petroleum products, as compared with higher revenue industrial products moving in other districts.

The West has not yet grown to the point where freight rates can be reduced to the

level of rates in the eastern, southern and mid-western and southwestern areas. To show the difference as it existed just prior to Pearl Harbor, we present a table comprising the relative traffic strength of Mountain-Pacific territory with the other districts.

These figures explain, in some measure, the reason for relatively lower freight rates on traffic moving within the Eastern and Southern districts of the United States, but they do not answer the question being asked by Western industrial manufacturers as to what the railroads will do for them now and in the post-war period, with regard to reduction of their freight rates due to changed conditions since Pearl Harbor.

The railroads' present answer was given in the first installment of this article, namely, "wait and see what the postwar situation is," but conditions can change rapidly between now and the end of the Pacific war, to a point where Western industry may be asked by Western railroads to outline the freight rate reductions they need to continue operations, develop their business and compete with eastern producers.

Heretofore, shippers have had to go to Western railroad traffic managers in a more or less supplicating manner and make an earnest request for relief from high rates, but we venture to say that Western railroad executives are giving serious consideration, even now, to the freight rate needs of industries located on their respective lines. We may very shortly see them calling upon leading industrial traffic managers to work out a mutually satisfactory basis of rates not only for business moving within Mountain-Pacific territory, but on transcontinental traffic as well.

This will be no altruistic movement on the part of railroad managers, but rather a far-sighted measure designed to protect railroad revenues from the onslaught of steamship and trucking competition, to say nothing of the air-cargo operations which have long since begun on two major transcontinental airlines.

In past times, railroad traffic managers waited for industry to bring its business problems to the railroad offices and dealt with them in a more or less summary fashion. Today, Western railroads are holding group meetings of traffic representatives within their own organizations, and the keynote is "What must be done on our railroad to hold the business we now have and develop new business to take the place of wartime traffic we have been handling." The answer to that question will be written in the next few years.

We predict a large share of the credit for maintaining freight revenues will go to those railroad executives who foresee the need for radical changes in our Western freight rates, and take the necessary steps to accomplish them.

It is axiomatic in any public utility busi-

RAILROAD PROFITS ARE ASSURED

ing expenses increased only 141 per cent. The Santa Fe figures are even better. Its operating revenues in 1943 were 205 per cent higher than in 1938, yet its operating expenses were only 113 per cent higher than in 1938. Operating expenses of the other lines show a proportionately lesser increase than their increase in operating revenues.

This proves the point that when railroad services are utilized to their fullest extent, any railroad can operate at a profit. When services are used to less than their full extent, the difference must be made up by higher revenues on less traffic; this can only come from higher freight rates.

Year	Southern Pacific Co. Pacific Lines	A.T.&S.F. System Lines	Union Pacific All Lines	Great Northern Railway	Northern Pacific Railroad	Chicago, Milwaukee, St. Paul & Pacific
OPERATING RATIO—RELATION OF GROSS EXPENSES TO GROSS REVENUES						
1938	78.7%	78.0%	70.4%	68.8%	82.5%	81.1%
1939	73.2%	78.3%	71.8%	65.9%	77.8%	80.0%
1940	72.7%	76.3%	71.9%	64.8%	75.1%	76.2%
1941	68.7%	69.7%	73.4%	62.6%	70.2%	70.0%
1942	59.4%	54.9%	62.0%	56.5%	64.7%	64.5%
1943	64.6%	54.4%	62.5%	61.2%	60.8%	64.9%

FIXED CHARGES—(Interest on Bonded Indebtedness)						
1938	\$28,839,476	\$11,207,291	\$14,366,038	\$14,273,364	\$14,643,339	\$24,098,136
1939	36,038,579*	11,056,700	14,395,376	14,215,770	14,495,411	23,882,832
1940	39,368,231*	11,197,400	14,937,771	14,212,128	15,100,303	23,693,515
1941	48,617,733*	11,020,161	13,942,687	13,915,920	14,574,288	23,408,385
1942	76,107,043*	9,819,915	14,171,810	13,710,996	14,648,878	23,265,746
1943	60,881,915*	9,051,971	14,176,746	12,506,172	14,428,720	23,068,001

*Increases reflect reduction of bonded indebtedness by liquidation of outstanding bond issues at maturity or prior thereto, in order to reduce interest payments.

TOTAL RAILROAD TAX ACCRUALS						
1938	\$14,413,570	\$14,988,200	\$15,293,995	\$ 8,364,234	\$ 6,836,321	\$ 8,705,000
1939	14,526,712	15,484,669	16,287,608	10,121,469	6,764,959	8,297,000
1940	14,256,946	17,159,640	14,693,389	12,273,206	7,035,623	8,720,000
1941	16,800,016	27,626,429	17,784,642	16,867,023	9,267,694	9,236,000
1942	57,732,040	76,266,283	61,744,144	30,727,340	18,919,789	25,701,000
1943	94,566,906	144,869,638	126,063,145	48,461,070	27,604,226	26,030,000
Increase:						
1943 over 1938	556%	867%	724%	479%	304%	199%

NET INCOME						
1938	\$ 2,425,439	\$ 8,228,044	\$18,701,234	\$ 2,712,560	\$ 4,322,414†	\$17,996,270†
1939	5,755,372	8,502,732	18,966,632	8,686,425	73,654	14,427,383†
1940	6,730,944	12,745,371	19,445,880	10,208,194	2,064,091	8,826,522†
1941	13,750,802	30,236,581	28,857,420	16,785,159	7,757,016	5,531,334
1942	18,224,513	73,664,352	62,083,985	29,054,021	16,303,918	12,174,831
1943	12,009,009	57,440,364	45,293,259	19,590,548	25,520,431	29,413,623
Increase:						
1943 over 1938	395%	598%	142%	622%	.....	.....

†Deferred.

CONDITION AS OF DECEMBER 31, 1943

	So. Pacific Company All Lines (Note 1)	A.T.&S.F. Railway All Lines	Union Pacific Railroad All Lines	Great Northern Railway	Northern Pacific Railroad	Chicago, Milwaukee, St. Paul & Pac. RR.
Total Fund- ed Debt*	\$638,812,251	\$271,317,500	\$368,713,028	\$290,873,909	\$319,783,735	\$431,314,154
Railroad Mileage Operated	12,686	13,137	9,836	8,095	6,884	10,820
Funded Debt per Mile of Line	\$50.356	\$20.653	\$37.486	\$35.933	\$46.453	\$39.862

*Includes interest bearing obligations of all kinds.

Note 1: Includes Pacific Lines, Texas & Louisiana Lines.

PERCENTAGE RELATION COMMODITY RATES—EASTERN RATES=100%

	Cotton Seed Oil	Fresh Meats	Packing House Prods.	Lime	Live- stock	Lumber	Plaster	Bulk Salt	Package Salt
Eastern District:	100%	100%	100%			100%	100%	100%	100%
New Eng. Terr.				120%					
Trunk Line Terr.				110%					
Central Frt. Terr.				100%	100%				
Southern District:	117%	126%	138%	99%	106%	92%	126%	125%	122%
Western Dist.:									
*West. Trunk Line:		99%	131%		109%		124%		
Zone I	107%			111%				126%	127%
Zone II	122%			126%				142%	142%
Zone III	134%			126%				153%	153%
Southwestern Terr.	129%	127%	159%	126%	109%	98%	124%	149%	145%
Mtn. Pacific Terr.	148%	137%	162%	149%	120%	108% ^a 136% ^b	142%	174%	170%

^a—To California points

^b—To other than California points.

*—Western Trunk Line territory is divided into four zones: Zone I includes Missouri (north half), Iowa, Wisconsin and southeastern Minnesota; Zone II includes the area west of Zone I and takes in the eastern half of the states of North and South Dakota, Nebraska and Kansas, and the southern half of Missouri; Zone III includes the western half of the states of North and South Dakota, Nebraska and Kansas, and the eastern half of Colorado.

It is noted that where rates for Eastern district, or Official Territory are considered 100%, our Mountain Pacific rates range from 8% to 74% higher than such eastern rates.

Area	1940 Population	1940 Railroad Mileage	Area in Square Miles	Population Per Mile of R.R.	Per Sq. Mile
United States—Total	131,669,275	233,670	3,022,387	563	44
Eastern District	66,796,119	71,283	439,181	937	152
Per cent of U. S.	51%	31%	15%		
Southern district	21,270,789	35,865	383,169	593	56
Per cent of U. S.	16%	15%	13%		
Western Trunk Line Terr.	16,654,577	54,932	573,401	303	29
Per cent of U. S.	13%	24%	19%		
Southwestern Territory	13,064,525	31,497	438,883	415	30
Per cent of U. S.	10%	13%	14%		
MTN.-PACIFIC TERR.	13,883,265	40,093	1,187,753	346	12
Per cent of U. S.	10%	17%	39%		

ness, whether it be a railroad or power company, that as the unit cost of a service to the public is reduced, the public consumption is greater, and utilities' profits are greater, despite the lower rate, fare or kilowatt charge. There will be some very interesting experiments along this line in the days to come.

We can all hope that the resulting freight rate adjustment in the Western states will not only hold the industries we have developed in the past and during this war, but induce Eastern industries to locate in the West and bring with them the additional business which will add to our Western railroads' prosperity.

More Safety Work; Less Labor Shortage

INCREASED attention to safety would prevent the loss of thousands of man-days of work by injured employees in war industries throughout the West and would be an important factor in alleviation of the manpower shortage.

That is the reason that the National Committee for the Conservation of Manpower in War Industries, sponsored by the U. S. Department of Labor, is concentrating on a series of safety campaigns in industries which have had the highest accident frequency rates. The campaigns are national in scope and in the Western states, as everywhere in the country, industrial and trade associations, labor unions, manufacturers, and safety and health agencies all are cooperating. This project is becoming increasingly vital on the Pacific Coast as

the tempo of the war against Japan increases.

A campaign has been in progress for the last six months in the slaughter houses and meat packing plants. The managements of these plants have welcomed this help and have given good cooperation. While the full effect of the campaign is not yet apparent, it is felt that the frequency of accidents in this industry will be improved as supervisors and workers continue to learn the causes and prevention of accidents. Already some notable results in individual plants have been recorded—one

plant reducing its accident frequency rate 51 per cent.

Recently an intensified educational campaign on accident prevention measures was launched in Western pulp and paper mills. There are some 75 or 80 industrial safety engineers, serving the national committee as special agents, who are active in this program of carrying the most effective safety measures developed in the plants having a good accident experience to the smaller plants where the development of an effective safety program has been difficult.

Paper is particularly important to the war effort, not only for magazines, newspapers and books but for packaging and wrapping munitions, arms, military equipment of all kinds and every type of food for the nation's fighting men. Pulp and paper manufacturers last year paid out in compensation claims more than \$2,000,000, while direct and indirect compensation costs together amounted to about \$40 per employee. During the next few weeks special agents are to visit 60 pulp and paper plants of Oregon, Washington, and California to aid in reducing the frequency rate in this industry.

The National Committee has been operating now for more than four years, with special agents in each state operating under their state chairman and making safety surveys without charge in any war plant which wanted their advice on accident prevention. More than 2,600 plants have been visited by the special agents in the eight western states which make up our region. Many of these were smaller plants which for the first time attempted to follow a sound safety program.

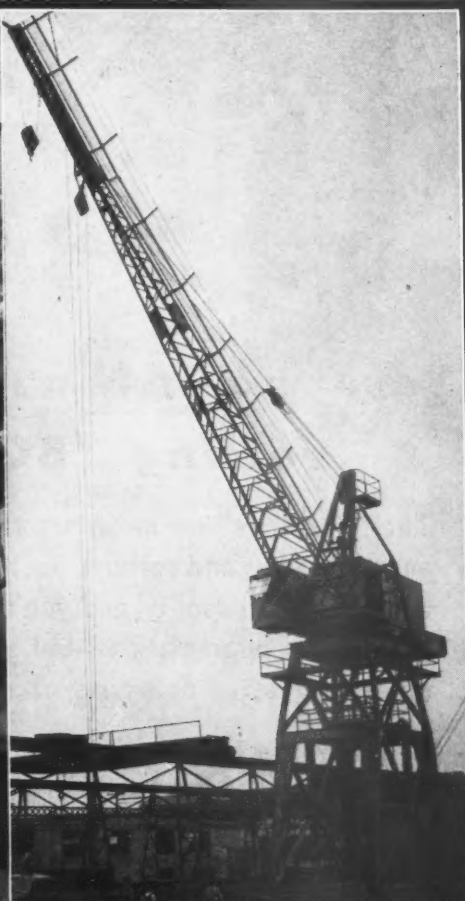
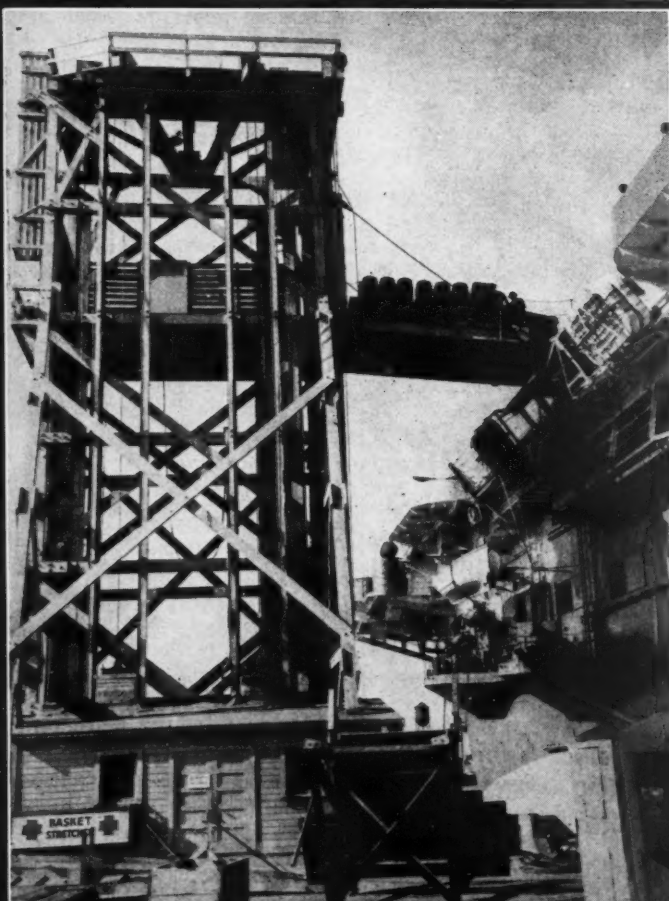
Since July 1 the National Committee has been concentrating its efforts on a campaign for a million fewer accidents and on three-month drives in special industries which appear to need our services most.

In connection with the drive for a million fewer accidents than last year, a special certificate of merit will be awarded to all industrial plants employing 50 or more which reduce their accidents by 40 per cent or more, either during the six-month period from July 1 to December 31, or from January 1 to June 30, 1945. Firms which seek the award should write to the regional office of the National Committee for the Conservation of Manpower in War Industries at Room 1507, 200 Bush Street, San Francisco.

Success in the campaign for a million fewer accidents than in 1943 would mean life instead of accidental death to 7,500 Americans and would save 44,000 more from being permanently crippled. When you realize that in 1943 there were 2,500,000 Americans injured while at work, with 18,100 deaths and 109,700 permanently crippled the tremendous value of this campaign is apparent to us all. If we work diligently for safety we can achieve that goal.

COLBY A FAMOUS NAME IN CRANES — MARINE ELEVATORS and MATERIAL HANDLING EQUIPMENT

You are cordially invited to write for a copy of "Wartime Production Story." In a very few pages this brochure describes pictorially the engineering and manufacturing facilities Colby can place at your disposal in post-war years.



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Taking Inventory of Employees Talents

WARTIME manpower conditions have brought into focus more clearly than ever before the necessity of devoting attention to tabulating, and rewarding employees on the basis of, progress and development, in the opinion of the executives of the Pacific Manifold-ing Book Company of Emeryville and Los Angeles.

That concern, the West's largest manufacturer of speed stationery, has adopted a Personnel Progress Report system under which department heads take stock of the employees under their direction twice a year, on a special form that measures nearly a score of factors. The department head outlines the duties of each employee, comments on the efficiency of their perform-

ance, notes improvement since the last report and the type of work in which the employee is especially proficient. He also lists special training for other work and recommends promotions when due.

The form also provides a check sheet to record below average, average, above average and outstanding ratings in intelligence, aggressiveness, loyalty, attitude, appearance, diligence, accuracy, interest in work and judgment.

To complete the record, information as to salary, recent increases, record of absenteeism and miscellaneous remarks are gathered on the same sheet.

The questions to be answered by the department head in the personnel progress report are as follows:

State present duties:

Are present duties performed efficiently? Please express your ideas fully:

In what respect has employee shown improvement in work since last report?

Work at which employee is especially proficient:

Has employee had special training in other work? Give details:

Is employee ready for promotion? If so, state your recommendations:

Please rate employee on all of the following qualifications as to whether he is below average, average, above average, or outstanding:

Intelligence:

Aggressiveness:

Loyalty:

Attitude:

Appearance:

Diligence:

Accuracy:

Interest in work:

Judgment:

Number days absent through illness last six months:

Number days absent through other causes last six months:

Is employee a steady worker?

Or does he take frequent time off during the day?

Do you recommend an increase in salary?

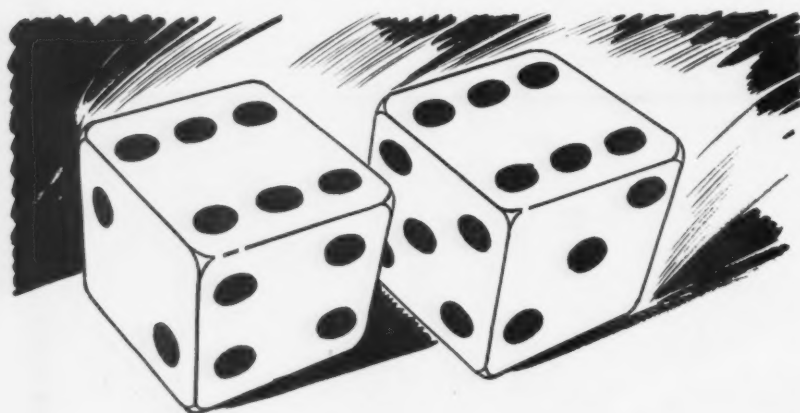
If so, how much \$..... Effective what date?

State reasons for your recommendation:

By inspecting several semi-annual reports, it is possible to trace the trend each employee is taking in his work, and by comparing these records with those of all other employees in a department, it is possible to develop a standing in which all employees are listed in the order of their value.

Pacific Manifold-ing Book Co., has found the system helpful in minimizing cases of "forgotten employees" who, on their record, are entitled to pay increases, has been able to determine when employees have reached the peak of their development, and has found as well an excellent system for bringing to light the talents of employees

(Continued on Page 46)



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rolling "BOX CARS"**

The "Box Cars" we mean are the Tank Cars, yes and the drums and carboys. Just keep them rolling back to your supplier and you'll not only win his thanks and appreciation—but you'll cash in with more and faster deliveries of needed chemicals.

As the war in the Pacific is stepped up, the West will be the center of a gigantic concentration of materials and supplies resulting in overtaxing all shipping facilities. Keep containers moving back to your suppliers. This is one way you can help us to help you—to keep an even flow of chemicals moving into your plant. Keep the cars rolling—yes, here's how you can win by rolling "Box Cars."



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Efficient records mean a smoother flow of work throughout your organization. And that's what Uarco Autographic Registers bring to business . . . bring convenience, accuracy and speed to the tedious job of keeping business records.

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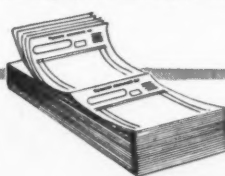
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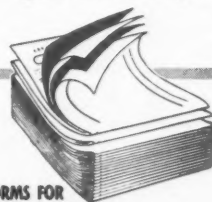
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Reducing of Welding Sizes Desirable Step

REDUCING the size of the welds in shipbuilding during the emergency shipbuilding program has been a step in the right direction, although it did not go as far as we would all like, and was an attempt to break away from something influenced by the riveted type of design.

This step changed the large size inter-

By M. N. Maltseff*
Western Pipe & Steel Co.,
South San Francisco, California

mittent fillet welds, closely spaced, to continuous fillet welds of reduced size. For example: 3/8x3 in. fillet weld spaced 6 in. can be changed to 5/16-in. hand, or 1/4-in.

automatic continuous fillet weld. This change alone saved many hours of pick-up welding, as required by inspection to correct improperly spaced fillet welds.

The main point of this concession, in my opinion, is that the majority of welds, say in the double bottoms, were brought to the economical and reasonable size of 1/4-in. continuous fillet, which in most cases is sufficient to provide necessary strength.

The designer should know and appreciate the difference in cost and value in

(Cont'd on Page 42)

*From paper presented at American Welding Society meeting, Cleveland, Oct. 16, 1944. Courtesy *The Welding Journal*.

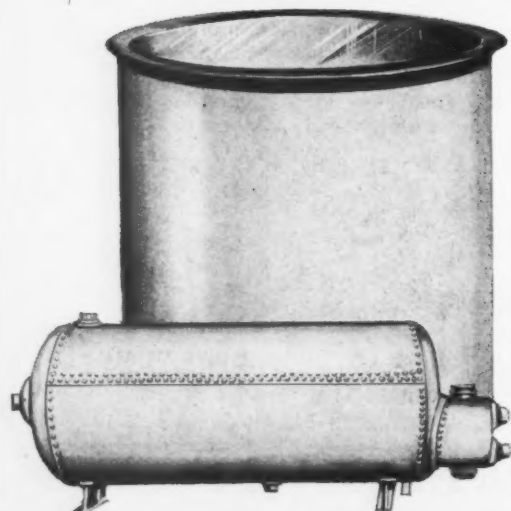
• Comparison of maximum welding time required to weld 100 lineal feet of various sizes of minimum welds.

SIZE OF FILLET	DOWNHAND					VERTICAL				OVERHEAD			
	CU. IN OF WELD PER 100 FT	AWS ELECTRODE SIZE	ARC TIME HRS MAX	NORMAL PROFIC %	TOTAL TIME HRS	AWS ELECTRODE SIZE	ARC TIME HRS MAX	NORMAL PROFIC %	TOTAL TIME HRS	AWS ELECTRODE SIZE	ARC TIME HRS MAX	NORMAL PROFIC %	TOTAL TIME HRS
1/4"	41.3	E6012 1/4"	18.92	50	3.78	E6010 5/32" 3/16"	5.67 4.36	40	14.15 10.80	E6010 5/32" 3/16"	5.67 4.36	30	18.85 14.52
5/16"	64.4	E6012 1/4" 5/16"	2.96 2.01	50 50	5.92 4.02	E6010 3/16"	6.17	40	15.40	E6010 3/16"	6.17	30	20.58
3/8"	92.4	E6012 5/16"	2.51	50	5.02	E6010 3/16"	9.76	40	24.38	E6010 3/16"	9.76	30	32.50

NOTE: Normal arc proficiency takes into account fatigue factor for various welding positions.

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Contamination of your product ceases. A HEBCO engineered glass lined tank is the answer to your contamination, rust and corrosion problems. We fabricate all types of pressure and open top tanks using a glass lining with the same coefficient of expansion as the metal in the tank.

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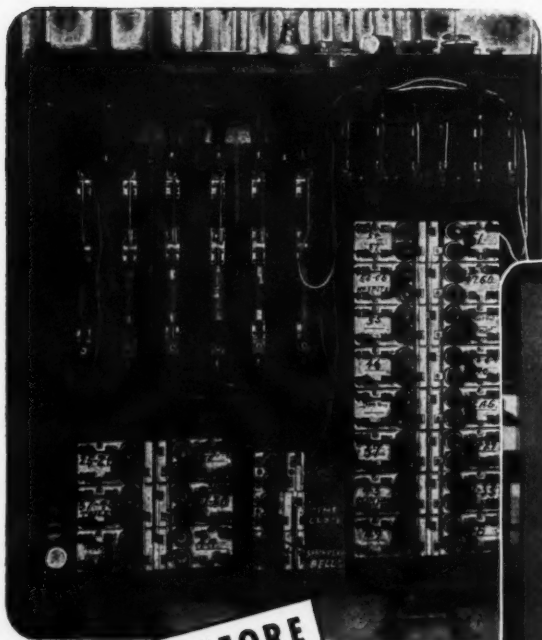
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Conversion Plan!



BEFORE

● Panelboards, taxed beyond their efficient capacities, are a drain on the productivity of any plant—regardless of its size. This speedy Conversion Plan involves such a moderate investment that it “pays off” in a hurry, even in the smallest plant.

The pictures above show a typical conversion. With a minimum of time and labor and at no increase in space, 25 lighting circuits were increased to 42—up 68%. Circuit breaker convenience and protection replaced obsoleted fusible circuits. Notice, too, that Saflex units were installed for the main controls, with sufficient space provided for an additional circuit, if and when it is needed.

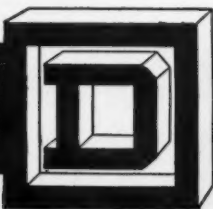
Remember, such conversions as these utilize existing boxes and conduit. The cost in time and



AFTER

money is small. The dividends in conserved power and increased efficiency are substantial. Your nearby Square D Field Engineer will be glad to analyze your present equipment and submit a tailor-made conversion plan for your consideration. This service costs nothing—pays big dividends.

Write for a free copy of “MORE CAPACITY” which shows a variety of conversions in detail. Address Square D Company, 1318 East 16th Street, Los Angeles 21, California.



SQUARE D COMPANY

LOS ANGELES

• DETROIT

• MILWAUKEE

WELDING (Cont'd from Page 40)

specifying the size of weld for various positions. In some cases it is better to put longer welds of smaller size, than shorter welds of larger size.

We know that intermittent fillet welds produce less shrinkage than continuous welds, but so long as we have to take care of shrinkage, a little more of it can just as well be cared for either by allowing for it or by providing extra material to take care of the shortening resulting from shrinkage.

Other factors such as time, material and, therefore, cost, should be considered. Too much weld is just as bad as, or possibly worse than, not enough. Excessive welding actually weakens a structure instead of adding strength. Oversize welds not only waste welding rod, but they add unnecessary heat input and wasted manpower.

The accompanying table shows comparative values as to the pounds of welding rod and time required to make 100 ft. of weld of three common sizes, in various positions.

From the table, we can see that the 5/16-in. fillet weld requires about 56 per cent more metal than 1/4 in., and 3/8 in. requires approximately 43 per cent more than 5/16 in. The time consumed in depositing the various sizes of fillets in down-hand positions does not vary appreciably for the reason that large size electrodes are used to deposit the required fillet in one pass.

When we compare the vertical and overhead positions, in which positions most of the welding has to be performed on a ship, the total time consumed in making the different sizes of fillets varies considerably. You will note that arc-time hours, that is, the actual time required to deposit a certain size of fillet weld in vertical and overhead position, is practically the same. The efficiency factor is different, however, because fatigue is greater in the overhead position than in the vertical.

Now, suppose that for some reason a 3/8-in. fillet weld was specified in a certain place where 1/4-in. fillet weld would

answer the purpose. It will take 32.50 hr. to deposit 100 ft. of 3/8-in. fillet weld in the overhead position, and only 14.52 hr. for the 1/4-in. fillet weld. In the vertical position, it will take 24.38 hr. for the 3/8-in. fillet weld, and only 10.8 for the 1/4-in. fillet weld. In other words, it takes more than twice the time to deposit a 3/8-in. fillet weld than it would take for the 1/4-in. fillet weld.

So the oversized weld specified on a drawing by a draftsman or engineer without good reason or study, costs a considerable amount in wasted man-hours and material, not counting the actual harm done to the structure by the oversized weld.

Function of Automatic Welding Equipment in Ship Construction

Discussing the technical control of welding in ship construction before the American Welding Society, M. H. MacKusick, assistant shipyard superintendent and welding engineer, California Shipbuilding Corp., said regarding automatic welding equipment:

"Most shipyards organize a separate welding department to handle their automatic welding. The use of submerged-arc automatic welding is principally confined to subassembly operations, although some yards do certain types of joints on the shipways.

At Calship, the use of automatic welding is confined to the plate shop and subassembly; all shipway welding is done manually. The use of E6030 type manual electrodes plus the fact that less movement of equipment is involved has prompted our decision

to eliminate the use of automatic welding on the ways.

"It was found that delays in scheduling an automatic machine for a certain weld plus the cost of handling the equipment to and from each joint exceeded the cost of welding the same joint by hand. Also many joints could not be completely welded by machine due to clearance for the machine at hatch coamings and side shell ends of deck butts so that a certain amount of chipping and manual welding was required on a number of the welds in any case.

"It is our conclusion, therefore, that shipyards working to a fast launching schedule will find that automatic welding should be entirely concentrated on subassembly work for economical and fast production results."

EXAMPLE OF *Service:*

A modern bronze bushing plant equipped with highly specialized equipment to produce Bronze Bushings to Blue Print Specifications, any alloy.

Large stocks of finished (ready for use) Bronze Bushings S. A. E. 660 alloy conveniently located in all principal Pacific Coast cities to better serve you.



NOW AVAILABLE
OVER 500 SIZES BRONZE BUSHINGS
OVER 400 SIZES OILITE BEARINGS
plus a complete range of sizes
MACHINED AND CENTERED BAR
BRONZE OILITE BAR BRONZE

WRITE for our CATALOG NO. 11 which shows a complete range of sizes "IN STOCK"

Kingwell Bros. Ltd.

457 Minna Street

SAN FRANCISCO, CALIFORNIA

P.O. Box 708

UNIFORMITY



Alike as peas in a pod! The identical uniform quality found in Larchford-Marble glass containers—quality that is reflected in widespread acceptance of these containers in the food, wine, liquor, soft drink, brewery, chemical and allied industries.



LARCHFORD-MARBLE GLASS COMPANY
 7507 SOUTH ROSENBERG AVENUE, LOS ANGELES 1, CALIFORNIA
 NORTHERN GLASS CO., 118 SACRAMENTO ST., SAN FRANCISCO 11

Often the question is asked, "How long should selling copy be?" The answer is strikingly dramatized in this 2-color advertisement... the first in our client's 1945 trade journal campaign..."Just long enough to tell the *WHOLE* story of the product advertised!"

If the copy is *direct* and *orderly*, the reader will know *at a glance* what is offered for sale. If the art parallel is literal enough so that the reader gets to the point quickly, and knows immediately *why* it is offered to *him*, particularly... it's the kind of advertising that will sell merchandise!

PLANNED

PREPARED

PLACED BY

Tomorrow industrial advertising will build bridges of human understanding between labor and management... spark the ideas that will keep men working steadily... add a new dignity to American ingenuity the world around. But, at The McCarty Company, it's doing a great job *today*! In considering your present and postwar advertising, we invite you to share our experience and facilities as advertising counselors to western industry for more than a quarter century.

THE McCARTY COMPANY

A Complete Industrial Advertising Service Since 1919

LOS ANGELES 15, BENDIX BUILDING • SAN FRANCISCO 5, RIALTO BUILDING
 PITTSBURGH 19, KOPPERS BUILDING • FORT WORTH 2, DAN WAGGONER BUILDING
 MEMBER...AMERICAN ASSOCIATION OF ADVERTISING AGENCIES

Mexico Water Treaty Again in the Offing

WASHINGTON, D. C.—When the hearing before the Senate foreign relations committee begins on the proposed treaty with Mexico to give our southern neighbor a generous volume of the water of the Colorado River and certain privileges and properties to



control the water, in exchange for water from the Rio Grande and Pecos rivers, it is likely that they will crackle.

In all likelihood, Rep. Carl Hinshaw, the only Republican in southern California to be reelected, will introduce again his bill in the House attacking the legality of the proposed treaty on the ground that it would be unconstitutional for the federal government to give away designated resources and rights of the states and the citizens affected. Although the bill is considered not to have even a remote chance of adoption nor to have any effect on the progress of the treaty, it is

important because it sharply focuses attention upon the whole problem.

Those who are against it, which includes the substantial elements of California, Oregon, Washington, and some important elements in Arizona and Nevada, boil down their opposition to the easily understandable contention that the treaty means the federalization of the Colorado Basin. They feel if the treaty can be put over without proper, orderly, open and deliberately public consultation of the states and the citizens of the Colorado Basin, the process invades the fundamental right of the citizen and the state to have full knowledge about the disposal of such primary resources as water, before those resources are handed over to another nation.

As a matter of fact the deep, almost unspoken objection is even more fundamental. The principle, as the opponents see it, is the same principle that is involved in the dispute over the Jackson Hole country

One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month authoritative comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Avenue, N.W., Washington, D.C. Inquiries will be answered free of charge. You also are invited to contact him personally in Washington. Copies of pending congressional bills may also be obtained free of charge.

of Wyoming. It will be recalled that the President, by executive order, has authorized the Secretary of the Interior to appropriate the Jackson Hole area and make it into a Federal Memorial Park. The opponents hold such action should not be at the discretion of the Executive, but should be determined by Congress.

In order to circumvent the executive order, Congressman Frank A. Barrett of Wyoming has introduced HR 2241 which would transfer the whole Jackson Hole responsibility to Congress. In other words,

BUY U. S. WAR BONDS AND HOLD THEM!

SMOOT-HOLMAN

The Smoot-Holman name on commercial and industrial lighting equipment means quality...quality today (even in the face of production restrictions)...quality tomorrow, when with many new names entering the field, a good name will more than ever be your protection.



OFFICES IN PRINCIPAL WESTERN CITIES • BRANCH AND WAREHOUSE IN SAN FRANCISCO

federalization by fiat, by means of legal by-passes, by unpublicized individual initiative, is the issue these Westerners stubbornly maintain is inherent in the Colorado River treaty, the Jackson Hole Memorial Park, and similar projects aimed at ultimate federalization, regardless of the legal form in which they are presented.

One of the most striking aspects of this contest over the treaty is that Judge Clifford Stone of Colorado, head of the interstate organization which supervises the affairs of the Colorado River, is regarded as the aboriginal treaty champion outside of the State Department and the White House. The judge, who is big enough in national stature to have been suggested as the prime Assistant Secretary of the Interior, is usually named as the force that sold the idea of the treaty to the upper states—and elements in the lower states—of the Colorado Basin.

The identification of a man of Judge Stone's caliber and character with the principle involved is striking because Delph Carpenter, and other Coloradoans, were the earliest proponents of the inviolability of the rights of states when the Colorado River pact was first discussed. Judge Stone is generally assumed to belong to this school, and it is this school which strenuously maintained, in opposition to all federal proposals a quarter century ago, that Colorado had an absolute title to the corpus of the water, meaning that not a drop of water might in reality be allowed to go below the Colorado state line without the express or implied consent of the State of Colorado.

This extreme assertion of state's rights is in dramatic contrast to the approval of federalization as inherent in the proposed treaty. Judge Carpenter and his associates in the upper Basin States have never given an appealing reason for their championship of the treaty, except the boogie-man assertion that if the sovereign nation of Mexico is not given what it demands it may ask for a board of arbitration, to be composed of a representative of Mexico and of the United States, and a third member from Latin America to be chosen jointly and to be acceptable to both Mexico and the United States.

The other scare-crow often hoisted is the assertion that the fight against the treaty comes almost wholly from southern California, which although it admittedly needs the Colorado River water for fulfillment of its destiny, is alleged to be entirely outside of the Colorado River watershed and basin, and therefore has no real place in the councils that settle the disposition of the water.

There has always been an acute divergence in policy and purposes between the people in the upper states of the Colorado River and those in the lower states. It seems incredible this divagation should lead to an action so serious to the destiny

(Continued on Page 46)



Roebling produces every major type of wire and wire product...toaster cord to telephone cable... bridge cable to wire rope...fine filter cloth to heavy grading screen...strip steel and flat wire to round and shaped wire...all Roebling products. All the result of over 100 years of wire specialization. John A. Roebling's Sons Company of California. San Francisco, Los Angeles, Seattle, Portland.



ROEBLING

PACEMAKER IN WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • SLINGS • SUSPENSION BRIDGES AND CABLES
COLD ROLLED STRIP • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS
AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • AERIAL WIRE ROPE SYSTEMS • ROUND
AND SHAPED WIRE • ELECTRICAL WIRES AND CABLES • WIRE CLOTH AND NETTING

of the whole region as that which is assumed to be inherent in the results of the proposed treaty. Yet, the psychology of sectional apartness causes strange alienation.

Judge Stone is usually made the target for much of the impatience about the treaty, but it is indubitably unfair to saddle the judge with the responsibility for the upper states' support of the treaty. He is unavoidably the instrument through which the support has been made vocal and visible.

He undoubtedly is handicapped at this stage of the game because we are told it is not possible for the Western champions of the treaty to put forth their most devastatingly convincing arguments until the

Senate Foreign Relations Committee holds its hearings. Then, we are told, the facts will be told. Our upper state friends say they do not wish to try their case in public, and that is exactly the key to the situation.

Those who oppose the treaty also believe that the business of the public should be made clear to the public. It is typical of these times that this reporter was warned it might be embarrassing to write this letter because the hearings in January would inevitably reveal that the people of the upper states are right, and that the people of the other states are misled.

It was implied that an assumption of any

validity in any claim except the upper states' claim would cause the reporter to be caught out on that well known limb. It is one of the tragic imponderables of life that you can never find out about those limbs until you go out on them. In this case the reporter will have one consolation. He will be in the company of some of the most distinguished personalities the West has produced the past century, including Senator Hiram Johnson, who is expected personally to lead the battle against the treaty.

Predicts Geneva Will Continue

Latest clues to the postwar Geneva Steel mill situation are the statements of Enders M. Voorhees, chairman of the finance committee of U.S. Steel Corporation, who said that unless large demand for steel existed in the postwar period, his company had no plans at present to acquire Defense Plant Corporation war plants now being operated by the government, and a reply by Gus Backman, secretary of the Salt Lake Chamber of Commerce, that the plan would be reconverted to civilian use regardless of who operated it.

"We have a cooperative agreement between steel consumers on the Pacific Coast and a Utah group under which the plant will be converted," Mr. Backman said.

Guayule Factory

Construction on the \$4,000,000 mill at Bakersfield, California, to process guayule is under way and it is expected the plant will be in operation by March. It will be equipped to handle 30 tons of guayule shrub, which will yield approximately 5,000 pounds of rubber material daily.

Employee Talents

(Cont'd from Page 38)

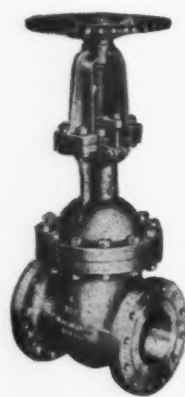
in one department who might be considered for advancement in other lines of work.

An additional value of the system lies in the fact that the required reports bring to light any cases involving personal dislikes of the department head for an employee which might hamper that employee's progress. If a report constantly shows "no improvement," the department head is consulted as to the details of the situation, further investigation is made and dismissal of the employee or a transfer to another department is considered.

The Personnel Progress Report plan was based upon a method suggested by the National Conference Board. Recently the method was expanded and an Employee Merit Rating study made to give the company a complete inventory of manpower that revealed the weak employees in each department, replacement of whom might be considered in postwar days.

WALWORTH STEEL VALVES

*A Complete Line
for Steam, Oil,
Water and Gas*



Increasing temperatures and pressures require valves built to give trouble-free service on the toughest jobs. Walworth steel valves have heavy walls for extra strength. Deep stuffing boxes eliminate costly leaks. High velocity non-turbulent flow is made possible by streamlined ports.

Walworth's line of steel valves gives added support to the Walworth policy—"The correct valve for any and every service." Whatever your valve need—whether steel, bronze, or iron—specify Walworth.

Walworth California Company carries Youngstown steel pipe and all the other necessary essentials for a complete piping installation.

WALWORTH CALIFORNIA CO.

Distributors of WALWORTH Quality Products and Allied Industrial Lines

"BRING YOUR PIPING PROBLEMS TO WALWORTH"

665 SIXTH STREET • GARFIELD 3950 • SAN FRANCISCO 1, CALIF.

REGIONAL REVIEWS

COLUMBIA EMPIRE

LITTLE by little indications are piling up that the relatively modest unassuming city of Portland intends to assert itself a little more from now on out and to make a really strong bid for postwar industries.

Early this year Portland business men and industrialists, alarmed at the prospect of a grave postwar unemployment problem, stepped out and raised \$168,000 in contributions solely for the purpose of promoting industrial development of this area.

With this money the committee promptly hired an industrial engineer, Clarence Seage, to work with the industries committee of the Chamber of Commerce to collect facts to be used in the program of expanding existing industries and bringing in new ones.

In November a second engineer was hired. He is Chester K. Sterrett, who was in charge of the industrial development division of the Cincinnati Gas & Electric Company for 18 years. Last year he was chairman of the smaller industries committee organized by the Committee for Economic Development in Cincinnati. He was also consultant for the War Production Board and the Smaller War Plants Corporation in that city.

Simultaneously the Chamber of Commerce itself expanded, hiring an additional statistician and a foreign trade consultant. The foreign trade expert is Carter Brandon, who has lived in China, the Philippines, Dutch East Indies, Siam, and the Federated Malay States representing several American firms. Brandon is an Oregonian and a graduate of the University of Oregon's school of business administration, foreign trade division. He considers his first big problem as that of getting Portland served with regular and frequent service to all foreign ports.

At the same time the Bonneville Power Administration is adding to its high-powered development staff. During the month it engaged Lawrence J. Parker, former electrical engineer with the west coast regional office of the U. S. Maritime Commission at Oakland, Calif., as an industrial engineer for the mid-Columbia district. His duties are to "aid in developing new industries and power markets in the Pacific Northwest."

If manpower means anything something ought to come out of all these appointments. The conservative, normally slow-moving Northwest has never tried so hard before.

Industrial Fair

Portland is holding an Industrial Fair. Without much fanfare or publicity Port-

land launched its first industrial fair on the night of December 9 with an address by Mayor Earl Riley. The fair was initiated by Ray Shawcross, head of the alien property custodian's office in Portland. Its main purpose is to interest actual or potential industrialists in this area in the various patents that are available. Out of 45,000 patents collected by the custodian's office

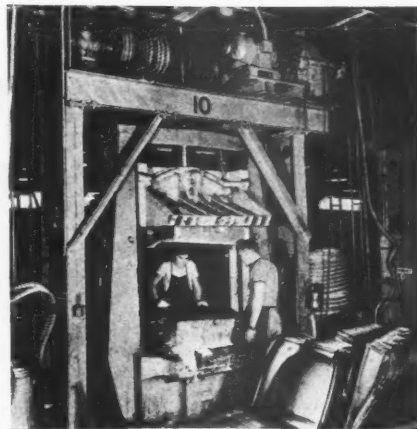
150 have already been licensed in this area.

In addition to patents however, the fair is illuminating in showing some of the actual progress that has been made industrially in Portland. Between 35 and 40 local industrial exhibits are being shown in the civic auditorium. Here are a few samples of the exhibits:

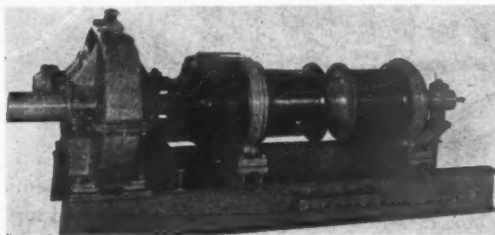
The E. F. Hauserman Company of Cleveland is displaying a knock-down steel partition for office buildings that will be manufactured here after the war. This

(Cont'd on Page 48)

Hammering OUT PLANES TO HAMMER OUT THE AXIS



Lockheed, Douglas, Convair, Northrop, Ryan and many others are using this drop-hammer drive to increase production.



When airplane production first became a national necessity, drop-hammer drives were breaking down frequently. Engineering Products designed this drop-hammer drive to keep the hammers going. It has been completely successful in every application.

On Engineering Problems call Engineering Products

ENGINEERING PRODUCTS CO.

1600 SO. SAN PEDRO ST. • PROSPECT 7044 • LOS ANGELES 15, CALIF.

COLUMBIA EMPIRE (Cont'd from Pg. 47)

company expects to build a plant here after the war.

The Ramsey Manufacturing Co. had a display of hoist and motor winches of various types.

Marine Electric Company has a display of motors and generators, also electric hardware that it manufactures for ships and shipyards.

One of the most interesting exhibits is a walk-in type of refrigerator made of aluminum and manufactured by the Beall Pipe and Tank Company. This company is doing a lot of experimenting and pioneering in new uses for aluminum.

These are examples of only a few of the

exhibits. The fair might easily have been made a much bigger thing than it actually is, but even at that it will serve some purpose in helping to make this area just a little more industry conscious.

Payrolls Drop

Just exactly what is happening regarding employment trends in Portland is not too certain. In the middle of November L. C. Stoll, state manpower director announced that Portland shipyards had made a net gain of 5000 workers since August and that 13,000 more persons must be added immediately to the payrolls of major war industries and sub-contracting firms if the Portland-Vancouver area is to meet its war contracts on schedule.

A few days later, however, the State Industrial Accident Commission announced that Oregon's covered industrial payroll totaled \$49,248,023 for October, a drop of nearly \$3 million from October, 1943. Nearly 70 per cent of the total state payroll is accounted for by industries located in Multnomah County.

December figures should show an even bigger drop as the seven-day week is eliminated in the two largest yards totaling 68,000 employees. The last of the high-priority AP-5 troop transports has been launched and Oregon Ship is now back at the job of building Victory ships while Vancouver is turning to construction of the big C-4s for which it now has contracts totaling 25 vessels.

There seems to be a general feeling, even in high places, that the first of the year will see a general loosening up of the manpower situation in this area. The guess is so far, that Oregon Ship will be the first to feel the blow with Swan Island and Vancouver following. Vancouver's C-4 contracts are expected to take it through 1945 without any substantial contraction. These three Kaiser yards account for approximately 90,000 of the 120,000 shipyard workers in this area.

Aluminum Irrigation Pipe

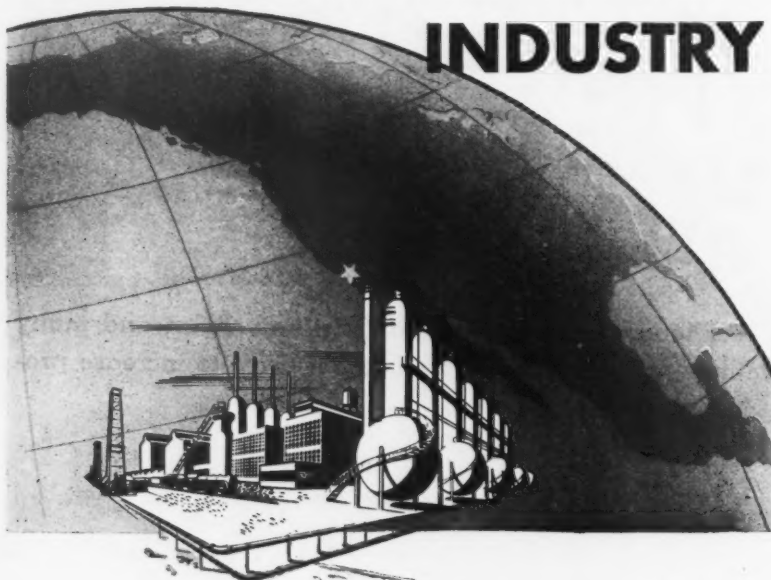
Another step towards making use of the Northwest's vast aluminum producing capacity was taken last month by the Beall Pipe and Tank Corporation. Beall announced production and perfection of a new alloyed, tempered aluminum pipe ideally suited for portable irrigation systems.

The new pipe is only one-fourth as heavy as galvanized steel tubing which is customarily made in 20-foot lengths. It can be made and handled easily in 40-foot lengths and is said to be stronger than steel pipe, is also rustproof and has a newly patented coupler that dispenses with levers and latches. More than 14,000 feet has already been produced for experimental purposes. WPB is now allocating aluminum for this purpose.

Columbia Empire Industries

At its annual meeting in November the Columbia Empire Industries Inc. devoted a great deal of its time to worrying over states' rights and growing federal encroachment in business. In between moans it managed to elect 18 new directors for 1945. They are: R. E. Epperly, Albany, one-year term; Ray F. Becker, Portland; Kenneth W. Ford, Roseburg; William H. Mermsen, Baker; M. N. Morris, Medford; H. H. Pein, and Wells O. Wheeler, Portland, two-year term; R. B. Ambrose, G. A. Brown, Walter L. J. Davies, Thomas C. Young, Portland (to serve as directors also of the Oregon Manufacturers Association for the same period); Ralph Chapman, Corvallis; Louis Geylinger, Grants Pass; Lester H. Hamley, Pendleton; Vern J. Johnson, Coos Bay; F. Lowden Jones,

MAAS Serves WESTERN INDUSTRY



THE HISTORY of A. R. Maas Chemical Co. is one of enterprise, stability and service. Year after year it has paced Western industry with improvement of method and facilities—developing uniformity and utility of product.

Today the A. R. Maas Company continues to search for better ways to serve all industry, so that—war or peace—its products will have the perfection that modern production methods demand.

We are proud of our Army-Navy "E" flag with its star—on honor awarded us "for continued outstanding production of war materials."



A. R. MAAS CHEMICAL CO.

4570 Ardine Street
SOUTH GATE, CALIFORNIA

"ARMed for Chemical Service"

Walla Walla, Wash.; Ray Larson, Nyssa; Lloyd Riches, Salem; and T. F. Sandoz, Astoria, three-year term.

Reconversion Held Up

No additional applications under the spot authorization program of reconversion can be made in the Portland-Vancouver area for 90 days it has been announced by Lee Stoll, state director of the WMC, and Paul Hirsh, deputy regional director of the WPB. This area is rated as too critical a manpower area to start thinking too much about peace-time industry yet.

Biggest Warehouses

Two of the new warehouses of the Pacific Overseas Air Technical Service Command at Alameda, California, are the largest single warehouses in the world, each having a floor capacity of 300,000 square feet. The seven warehouses which will make up the program will have an aggregate space of 1,330,000 square feet and will cost \$12,000,000. The command expects to ship more material from its bases at Portland, Long Beach and Oakland than will have been used in all the European air campaigns put together. The command stocks more than 500,000 different items of supply, about twice that of Sears Roebuck or Montgomery Ward.

Production Awards

Recent awards for outstanding efficiency in war production include the following:

Washington Iron Works, Seattle, third star for Maritime "M" pennant.

Isaacson Iron Works, Seattle, fourth star for Maritime "M" pennant.

Buckler Company, Portland, "M" pennant.

Columbia Steel Casting Co., Portland, second Maritime gold star.

Security Engineering Company, Whittier, Calif., fourth Maritime star.

P. J. Walker Company, Los Angeles, fourth Maritime star.

Marinship Corporation, Sausalito, Calif., national championship tanker flag for delivering five tankers in November.

Seaboard Coil Spring Co., Los Angeles, Army-Navy "E."

Hoffman Radio Corp., Los Angeles, Army-Navy "E."

Cannon Electric Development Co., Los Angeles, Army-Navy "E."

MANUFACTURER'S AGENT, located in Seattle, Wn. and covering entire Northwest can handle several new accounts. Well known to the trade as an aggressive business getter, has well-established and close contacts in field of general industrial products, including machine tools, steam specialties, electric heaters, industrial handling equipment, etc. Reply Box 501, **WESTERN INDUSTRY**, 503 Market Street, San Francisco 5, Calif.

Cal Conquers in Cans

California ranked well ahead of all other states in tin can salvage for the period from January through September, 1944. Records for the 11 Western states, in pounds are as follows:

California	63,452,050 lbs.
Colorado	4,851,915
Washington	3,995,130
Arizona	3,096,261
Utah	2,727,360
New Mexico	2,266,880
Oregon	1,601,050
Idaho	800,980
Wyoming	76,080
Montana	68,466

Disposal Idea

A plan whereby the City of San Diego or a group of local citizens would operate the Consolidated Vultee Aircraft Corporation plant No. 2 as a center for small industries after the war has been filed with the U. S. Senate Small Business Committee.

Idaho Pulp Mills

One of two pulp mills proposed by the newly incorporated Idaho-Montana Pulp and Paper Company will be erected in Coeur d'Alene.

Ingenious New Technical Methods

Presented in the hope that they will prove interesting and useful to you.



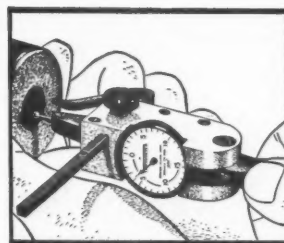
New Internal Gage Avoids Over Cutting... Saves Wasted Man Hours

At last a gage that takes the guess work out of checking internal diameters either machine bored, or close ground and lapped. It is called the Keene Internal Gage and is the first accurate method for fast correct checking of internal splines and gears on both minimum and root diameters. The gage is ideal for machining and inspection work, and proves its value in increased production. It can be used with either a master, or micrometers.

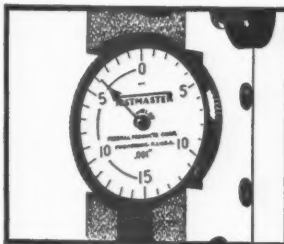
This time saving development is constructed of aluminum, is six inches long and weighs only five ounces. Available in models designed to read in thousandths (.001) or in tenths (.0001).

When your gage has been checked the thousandths left to bore, the actual job of machining may become tedious. It is then when Wrigley's Spearmint Gum helps keep you alert and watchful. Chewing gum seems to assist you over the dull spots in the day's work. And Wrigley's Spearmint will aid you in your peacetime job by helping to keep you wide awake and efficient during that part of your work that may seem unimportant, but which actually means perfection to the completed product.

You can get complete information from Keene Electrical Machinery Co., 542 W. Washington Blvd., Chicago 6, Illinois.



Determining correct setting for gage.



Closeup of dial showing simplicity and fast visibility.

WESTERNERS AT WORK...

Arizona

Grover J. Duff named manager of Arizona operations for the Eagle-Picher Mining and Smelting Co., replacing E. D. Morton who is retiring, and Edwin H. Crabtree, formerly mill superintendent of milling plant at Sahuarita, now chief metallurgist of the companies properties . . .

California

Alfred W. Eames, president California Packing Corporation since 1940 appointed member board of directors of Santa Fe

Railway. . . . James F. Pollard, former president Western States Gas & Electric Co., Salinas, and later president of Seattle Gas Co., joins executive engineer's department of Pacific Gas and Electric Co., San Francisco. . . . Glenn H. Bowes, Continental Oil Co., elected president Pacific Section of American Association of Petroleum Geologists, Robert T. White named vice president and Vincent W. Vandiver, Seaboard Oil Corporation elected secretary-treasurer. . . . E. S. McClure succeeds N. E. Dawson as vice president and

Los Angeles general manager of Soule Steel Company, Dawson continuing as vice president in an advisory and consulting capacity. . . . Si Edwards, Industrial Steel Treating Co., Oakland, appointed to serve two years on Board of Trustees of Metal Treating Institute. . . . Harvey S. Mudd, president and managing director of Cyprus Mines Corp., Los Angeles, elected president of the American Institute of Mining and Metallurgical Engineers for 1945. . . . George F. Wunderlich promoted from production manager to general manager of Eitel-McCullough, Inc., San Bruno; Louis Pierri, manager Salt Lake City plant becomes production manager of home plant at San Bruno; and Hewitt V. Wilson, assistant manager at Salt Lake City plant becomes manager there. . . . Congressman John M. Costello appointed general counsel and manager of Washington office of Los Angeles Chamber of Commerce. . . . William P. McGervey, Jr., named president, Hanford Foundry Co., San Bernardino; Arnold K. Steger made vice president, and Maurice W. Cardwell, secretary and treasurer, all three formerly being associated with Warman Steel Casting Co., Los Angeles. . . . Donald W. Douglas, president Douglas Aircraft Co., elected chairman of board of governors of Aeronautical Chamber of Commerce and E. E. Wilson, vice chairman of United Aircraft Corporation elected president. . . . Dwight L. Myers, formerly engineer for the Resurrection Mining Company at Leadville, Colorado, now senior mining engineer for the Kaiser Company, Inc., at its Vulcan mine, Kelso, California. . . . Harry A. Sutton, director of engineering for Consolidated-Vultee Aircraft Corp., resigned and his activities consolidated under direction of I. M. Laddon, executive vice-president. . . . E. H. McGin of the Union Hardware & Metal Company, Los Angeles, named on executive committee of American Hardware Manufacturers Association. . . . George C. Ford appointed works manager Consolidated Vultee Aircraft Corporation's Vultee Field Division, succeeding W. S. Clark. . . . Dr. Albert E. Lombard, Jr., former special assistant to Director of aircraft resources control office, appointed engineering consultant specializing in product development for Consolidated Vultee Aircraft Corporation. . . . John J. Buckley, formerly of Pacific Tube Company, elected vice president Pacific Tube Company, Los Angeles. W. P. Armstrong, formerly with Allegheny Steel Corporation in Pennsylvania, appointed sales manager of same company. . . . T. F. Aronson, Santa Clara Frosted Foods, elected to presidency Western Frozen Food Processors Association; E. E. Huddleston, of Santa Cruz Fruit Packing Co., and Honor Brand, elected treasurer. . . . Gail Vandenbraak, succeeding Lee M. Mountjoy, promoted from charge of local aircraft section to head War Production Board's Production Service Division, Los Angeles. . . . E. A.

If you want to MAKE IT SAFE



wire it with FIREWALL

Rockbestos Firewall Aircraft Wire is this company's latest contribution to the war effort. This wire, together with every other wire, cord and cable in the entire Rockbestos line is permanently protected by a dense, uniform felted asbestos wall that has been thoroughly impregnated with a special compound to insure absolute flame and heat-resistance. Heat that destroys ordinary insulation . . . dries it out . . . causes cracks, flaking, and eventual failure and replacement . . . never fazes Rockbestos.

Whether you want to wire or rewire . . . under normal or severe operating conditions . . . let us help you make the right Rockbestos selection. Remember, Rockbestos Wire . . . Cord . . . Cable . . . are permanently insulated.

MARWOOD

LIMITED

SEATTLE . PORTLAND . SAN FRANCISCO . LOS ANGELES

911

Verrinder promoted to chief engineer of Riverside, California Division of Food Machinery Corporation, succeeding G. C. Paxton. . . . Harry W. Hahn appointed vice president in charge of engineering and production for H. L. Harvill Manufacturing Co., Vernon. . . . W. M. Laughton, for 20 years connected with the company, appointed general manager of Bethlehem Steel Company's San Francisco and Alameda yards of Shipbuilding Division. . . . Harry C. Gunetti, former general superintendent, named general manager, Joshua Hendy Iron Works.

Colorado

L. F. Quigg, formerly vice president in charge of operations, Colorado Fuel & Iron Corporation, Denver, elected director, member of executive committee and executive vice president. . . . J. Glenn Donaldson appointed chairman of Ninth Regional War Labor Board and Nonferrous Metals Commission, replacing Charles A. Graham, who resigned to run for Congress. . . .

Idaho

M. M. Higbee of Wallace elected president of Coeur d'Alene Extension Mines, Inc., replacing George J. Couper. . . . Earl Chilcott named vice president, and E. E. Scott secretary-treasurer. . . .

Nevada

G. W. Nielsen, formerly plant superintendent at Gabbs for Basic Magnesium, Inc., named western manager Basic Refractories. . . .

Oregon

Frank E. McCaslin, president of Oregon Portland Cement Company, elected president of Portland Chamber of Commerce, succeeding David B. Simpson; Thomas E. Roach of Northwestern Electric Company elected first vice president; Chester A. Moores of Commonwealth, Inc., second vice president; Clark Burgard of John H. Burgard and Co., secretary of Chamber of Commerce Corporation; Charles A. Stewart of Portland Trust and Savings Bank, treasurer; and David B. Simpson of Norris, Beggs and Simpson, chairman of the board. . . . Chester K. Sterrett, engineer, formerly in charge of industrial development division of Cincinnati Gas and Electric Company, added to Portland Chamber of Commerce staff. . . . John D. Galey appointed chairman and William S. Lubersky vice chairman West Coast Lumber Commission, Portland. . . . S. H. Williston, re-elected president of the Oregon Mining Association at its annual meeting in Portland. Irving Rand elected vice-president and secretary. Directors, Worthen Bradley, Bradley Mining Co.; H. C. Wilmot, Bonanza Mines; D. Ford McCormick, Corden Mining Co.; Leverett Davis, Calahan Mining Co.; and F. W. Watson. . . .

Utah

H. P. Lambrecht, Salt Lake Hardware Co., Salt Lake City, elected president new chapter American Steel Warehouse Association, S. S. Taylor of the Galigher Co., vice president; H. C. Kimball, Z.C.M.I. Wholesale Hardware Division, secretary-treasurer. . . .

Washington

Eugene A. White, manager, Tacoma Smelter, American Smelting & Refining Co., Tacoma, elected one of six directors of the American Institute of Mining and

Metallurgical Engineers for 1945. . . . Dr. Wilson M. Compton, formerly head of National Lumber Manufacturers' Association and brother of President Karl Compton, becomes president of Washington State College, succeeding Dr. Ernest O. Holland. . . . Don W. Walters, resigns post as regional director, Smaller War Plants Corporation, Chicago, to become managing engineer, Inland Empire Research Corporation, Spokane. . . . William E. Breitenbach, resident manager of Port Angeles division of Rayonier, Inc., and Martin N. Deggeller, manager of Woodlands division elected vice presidents. . . .



Now . . . TUBBS CORDAGE COMPANY

Effective January 1, 1945, the two leading names of the West's cordage industry become one when the Tubbs Cordage Company of San Francisco and Portland Cordage Company of Portland and Seattle operate as the Tubbs Cordage Company. ★ While now our first obligation is in the supplying of rope to our armed forces, you will find our postwar products marketed under a unified group of trademarks and maintaining the uniform quality that has become the rope standard of the West.

Boeing Gets More Work Hours Per Truck By Systematizing...

SEVERAL features of the highly-systematized internal transportation system of Boeing Aircraft Company at their Seattle plants embody principles adaptable to smaller manufacturing plants or to warehouses.

First of all, every bit of incoming material is received at one point, instead of having motor truck drivers cruise around from door to door looking for the destination of their loads, interrupting operations and wasting their own time. Once unloaded, fork trucks pick up the material and move it to the desired spots in the plant.

With 300 to 400 loads coming in and out every 24 hours, it has become essential to have this work concentrated at one spot where it could be done efficiently. By having as much of the material as possible put on skids in the first place, handling time in the unloading area has been considerably reduced.

Second, parts or sub-assemblies, either completed or in process, are assembled by fork trucks in assorting areas for transportation by shuttle trains to other points in

the plant. This keeps the powerful lift trucks from being tied up in the lighter job of long-distance hauling which can be performed by less expensive motive units. A smaller plant could utilize the shuttle trains in similar fashion, or if lacking in light units could use the fork trucks to drag the shuttle train to its destination. Plants having a long distance between the manufacturing operation and the shipping department are especially able to increase their efficiency by the use of shuttle trains.

Third, a dispatching system for all equipment not being used on regular routes keeps the units where they are most needed, and enables those in charge of the transportation department to coordinate their facilities with the urgency of production demands.

Boeing's internal equipment consists of nearly 150 fork lift trucks, platform trucks, mobile cranes, scooters, and hundreds of dollies and racks. In addition they have a fleet of motor trucks hauling assemblies

This Assignment Slip for Operators Systematizes Use of Lift Trucks

Area No. Shop Called By Date 194.....

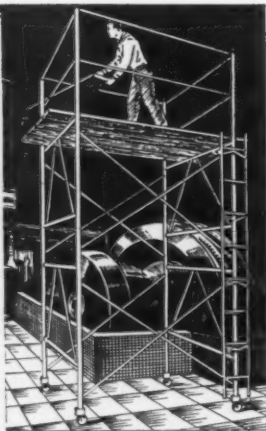
Assigned to Time Call Rec'd Time Started Time Finished

Description

NOTE: Turn In This Slip at Completion of Each Job.

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MARKAL PAINTSTIKS are made of special weather-resistant paint. The marks are clear, distinct, positive—not messy like the old paint bucket and brush method. Your records are safe and permanent when you "Mark with Markal".



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SAMPLES AND
LITERATURE

A Specific Type
MARKAL PAINTSTIK
for Every Marking Job

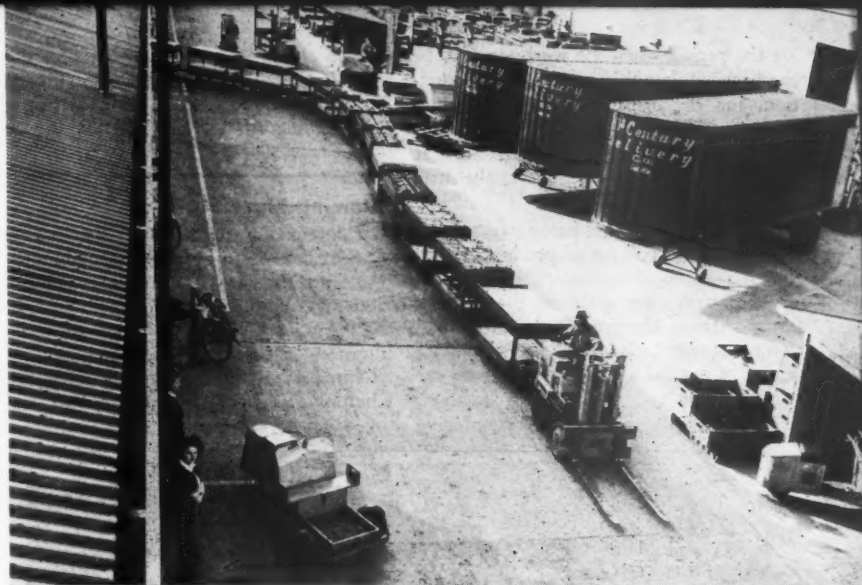
MARKAL CO. 618 N. Western Ave.
Chicago 12, Ill.
"Originators of Paint Sticks"

from the Seattle plants about eight miles to Renton, where the B-29's are finally completed. The dollies they have been developing for transporting unusual shapes have attracted widespread attention.

The secret of success in the Boeing dispatching system is in breaking up the plant into a sufficient number of areas as to permit easy control. When an area gets too big, the dispatcher loses control of the equipment and is unable to keep items moving from one department to another in that continuous flow that makes uninterrupted production possible.

Trucks moving on regular routes and on delivery schedules within the plant operate independently of the dispatchers. The dispatching system is reserved for a quota of lift trucks assigned to each area ready to speed to a point where work is piling up faster than the regular schedule will move it away, or where unusual handling operations are involved that are either unsuitable for the equipment assigned to the regular routes or else would throw the route trucks off schedule.

All calls for special service within an area come to one dispatcher, a girl who carries on other clerical duties in her spare time. When a truck is needed, she fills out a slip showing where the call came from, the person who made the request, the name of the operator sent in response, the time of starting and finishing the job, and a description of the work to be done. The



• From the unloading area, where everything from outside is received, shuttle trains make regular trips with materials and parts to the various plant manufacturing areas.

operator takes the slip out with her and turns it in at the completion of the job.

This record system is intended, first of all, to keep track of the trucks that are at work. Without it too many trucks could get involved in one job and be unavailable when something more pressing arose. The system makes it possible to handle the

special jobs in the order of their urgency, to analyze the time required for different jobs, and it also provides a record available for tracing down an occasional mis-delivery.

Peaks rise and fall in the plant in conformity with the variation in production operations. Usually the afternoon hours



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ECONOMICAL — SAFE**

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Mend — Reinforce**

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In all types of industry—production, maintenance or service—Punch-Lok Banding Method is at work... connecting hose, stopping leaks in steam or water lines, splicing electric cable, reinforcing and mending splits in cross-arms, poles and ladder rails, tying rigid conduit or flexible cable to pipe lines or girders, seizing ends of wire or manila rope to prevent fraying... in short, wherever a banding method can be used to connect, mend, splice or reinforce. Open end bands available for use when ends of work are obstructed. There are places in your industry where Punch-Lok Clamps would save you time and money.

CLAMPS... Made of flat, high tensile galvanized steel or of Everdur, which is a corrosion resistant copper base alloy. All clamps are double wrapped. Available from 3/4" to 48" I.D. Any larger size clamp can be pulled down to fit any smaller diameter.

LOKING TOOL... Sturdily constructed to assure long life. Locks all size clamps with a sufficient tensiopal pull.

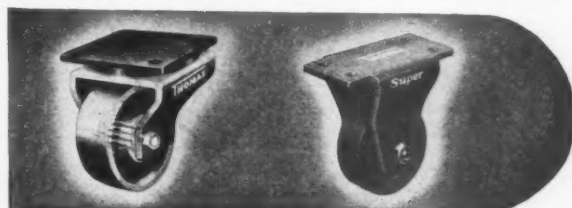
GROOVED FITTINGS... For hose lines—air, water, steam or any other fluids. Permits application of high pressure clamping without damage to hose.

★ Write for Descriptive Catalog and Name of Local Distributor

PUNCH-LOK COMPANY

Pacific Coast Representative:

H. M. THOMAS, Dept. B, 1554 Oakland Ave., Piedmont 11, Calif.



THOMAS SUPER CASTERS



- Formed Steel Construction
- Two Rows of Ball Bearings
- Hardened Thrust Collar
- Hyatt Roller Bearing
- Machined Wheel Face
- Grease Gun Fittings

Use them for your hardest, toughest jobs. The Super Swivel fork is formed from one piece of 1/4" steel plate, offset for added strength. Ball race cups and King bolt welded in place and all moving parts are hardened to move freely and resist wear. Write for new catalog No. 43.

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Ogden
Murray Sales Co.
18 Wazee Market
Denver
W. T. Billard
336 W. Wash. Blvd.
Los Angeles

THOMAS TRUCK & CASTER CO.
458 Mississippi River Keokuk, Iowa

are the period when the work tends to be the heaviest, but this is subject to fluctuation, and the dispatching system enables the transportation supervision to transfer units quickly from one area to another, if need be, to break any bottlenecks that may develop.

The system came into being when it was found that the volume of production and the complexity of operations necessitated a definite plan for utilizing the internal transportation. The present smoothly functioning system is the outcome of a long period of careful study, planning, and experimentation.

Various ramifications of the system have

grown up; for example, a system of bringing all the trucks to specified parking stations at the lunch periods. Refueling is done at one time without interrupting use of the trucks.

Alumina Plant Started

Construction of the power line for the cement and alumina plants of the Monolith Portland Midwest Company south of Laramie, Wyoming, has been started. H. D. McBride, Laramie, is manager of the oxide division of the cement company. In the alumina plant anorthosite will be treated, alumina recovered, and the residue used in the manufacture of cement.

Westinghouse Completes Big Expansion Program

Westinghouse has completed a \$1 million expansion program for repair of electrical equipment and steam turbines at Oakland, Los Angeles, Portland and Seattle, bringing the repair division's investment on the Coast in land, buildings, equipment and inventory to \$4 million.

In the Emeryville plant a building with 44,000 square feet of floor space bringing the total plant to 264,000 feet has been added and equipped, and increasing repair facilities 500 per cent. Straight line production and new tools have been installed at Los Angeles. The footage of the Portland repair plant has been quadrupled.

Alkali Plant Is Purchased

The Pacific Alkali Company soda plant, on the edge of Owens Lake, Calif., has been purchased by the Pittsburgh Plate Glass Co., Columbia chemical division, Pittsburgh, Pa. The plant will continue operations under the same management and staff.

The plant has been working three shifts per day, using 45 employees in the production of soda ash, sodium sequicarbonate, and packaged washing soap. Under the new management, products of the Inyo plant will go to the Pittsburgh corporation chemical division, for use in its manufacture of glass, paint and by-products.

White Collar Workers

Signs of renewed effort to organize white collar workers are shown in a circular being distributed in San Francisco by the United Office & Professional Workers of America, Local 34, CIO. It calls attention to the difference in minimum hourly earnings between clerical and non-clerical occupations and asserts that present clerical brackets, even though lower than non-clerical, are \$10 a month more than three months ago, due partly to efforts of the CIO labor members on the War Labor Board. It proposes a 35 per cent national cost-of-living increase and more scientific determinations of wage brackets locally, so that low salaries in one industry will not hold down those in all industries.

Seek New Products

The Hoffman Radio Corp., Los Angeles, has appointed a New Products Committee to suggest and develop postwar plans for the manufacture of products other than household radio receivers. It is chaired by G. G. Davidge, executive assistant, with Walt Taylor, engineering, as vice-chairman; Dick Throckmorton, in charge of Navy job 36; Clint Saxton, model shop; Bill Green, engineering; and Bill Blue, outside production.



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Our twenty years' experience in spring production assures you of accurate design, uniform quality in springs of all kinds.

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COMPANY • INCORPORATED

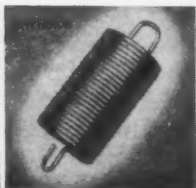
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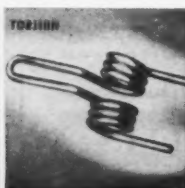
Los Angeles 15, California



FLAT STEEL



COMPRESSION



TORSION

REGIONAL REVIEWS

TEHACHEPI TO TIJUANA

SOUTHERN CALIFORNIA is "up-to-its-ears" in war work as we enter a new year of war. This area has plants producing in almost every "critical war material" group . . . and the pressure is really on.

There is less talk of an "exodus of war workers" from this area, although workers still are leaving war jobs. The turnover is down, but it still is there. Absenteeism has been a very pleasing aspect of the picture in that it is way down.

The real estate market did break during the "good news" months. By that we mean that it went from an absolutely insane market to just an insane one. It seems to be just as bad as ever now despite the homes being finished in critical areas. Nobody quite knows how to explain this.

While the world moves on, there are steady developments looking toward the post-war picture. One of the interesting ones to this area was the purchase of a controlling interest in Transmarine Navigation Corporation by Consolidated Steel Corporation, Ltd. Transmarine was the only shipping concern having headquarters in Los Angeles prior to the war. It represented steamship lines doing business throughout the world, but with emphasis in the Pacific Basin area. It is now a terminal operator for the U. S. War Shipping Administration in this area. It also handles a substantial volume of shipping for the Army Transport Service and for the Public Roads Administration in connection with the construction of the Pan-American Highway.

Consolidated is one of the leading ship-building concerns in the United States with yards in Wilmington, Long Beach, and Orange, Texas. It has done an able job of building 1000 vessels of almost every type.

The executives of both concerns prefer to let future actions speak for themselves other than to say that they believe in the future importance of the Los Angeles-Long Beach Harbor area as a shipping center, and as an outlet for the increased post-war exports of agricultural and manufactured products from this area. It is an active step forward in the strengthening of this area's position in the post-war maritime industry, a long-time goal.

While there is that development in the marine industry, the airline companies sponsored an Advertising Club meeting at which there was served lobster from Maine, grapefruit from Arizona, pheasants from South Dakota, and fresh mangoes from Mexico, all brought in by air. Alexander B. Royce, chairman, airlines committee for the United States Air Policy, told some of the things that must be done

to make the past prophecies of air transportation come true. Douglas, Lockheed, and Consolidated had models of post-war planes for domestic and international routes of commercial aviation. (Not models of washing machines . . . airplanes.)

Checking of rumors on automobile building on the West Coast has failed to show that large blocks of lands have been purchased by Ford, Fisher Brothers, or other concerns. We told this to a man who

is supposed to know some of the things that others don't know. His answer was this cryptic remark, "Do not be surprised at western developments in the automotive field." This, of course, can mean an increase in the number of western assembling plants, but any developments would be on the favorable side.

Odd Facts: With the demand for more and more war workers, plus the shortages that are showing up in consumer items (all types of less expensive clothing), plus the shortages of items like cigarettes, it is amazing to go through stores and see the large number of things offered for sale that are so non-essential that the average person could go through life without them.



Shipper's
SUPPLY CENTER
FOR TRUCKS, DOLLIES, CASTERS

VARIETY in styles and kinds of trucks, dollies and casters makes Colson the Shipper's Supply Center in the West. Everything in hand trucks from the smallest dolly to the largest platform truck is available at Colson's — more than 100 items are in stock. Call the nearest branch office when you need material handling equipment.

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EFFICIENCY KINKS FROM WESTERN PLANTS

Production short-cuts • Worker's suggestions • Prize-winning awards

FABRICATION of engine exhausts for cargo vessels represents a series of ingenious factory procedures by the Weber Showcase & Fixture Co. of Los Angeles that have been combined to reduce cost of manufacture and short-cut production time.

First a sheet of $\frac{3}{8}$ " steel plate, nine by six feet, is cut to a pattern which will fit one shape of the elbow to be formed. The



Illustration courtesy The Hobart Brothers Co.

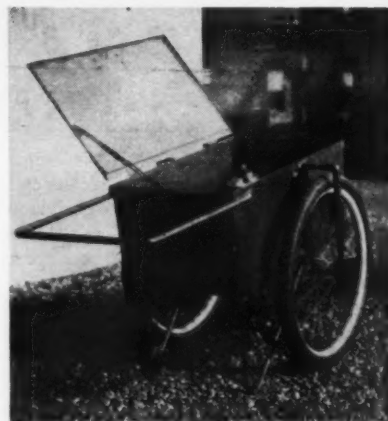
sheet, after having been torch cut, weighs approximately 300 pounds.

One at a time these pieces are swung into a blast furnace at a temperature of 1400 degrees and are heated for 15 minutes, after which they are removed and placed on the face of a female die of a hydraulic press nearby. Under 400 tons pressure they are pressed into elbow halves.

The rough shell which represents one-half of the elbow is taken to a cutting table where a portable radiograph cutting torch travels in a circular track around the curved edges of both sides of the metal, and the piece is trimmed down to the correct dimensions. After the actual trimming of the metal has been completed, the torch makes another complete trip and mitres the edges for welding the two halves together.

Joining the two halves is done with arc welding, but the method used to clamp and draw the edges to be welded into position is somewhat unusual. After preliminary tacking of the two halves together, two small brackets are welded on either side of the seam and a push-pull, screw type jack is fastened on these brackets and the seam drawn into a snug position where it is firmly held until the welding is completed.

Two welding necks are installed at each end and the 25" diameter welded elbow is completed and ready for installation in EC-2 cargo ships.



• Lubrication cart saves extra trips to shop.

At the Pennsylvania Salt Manufacturing Company plant at Tacoma a plant lubrication cart is used to carry all of the various lubricants and grease guns needed during the day, with the result that no extra trips are made back and forth between the shop and job at hand. All the necessary wrenches, hooks, packing, oil, and other items are carried along, yet the cart is light enough to require very little effort wheeling it from one location to another.

The cart was constructed in Penn-Salt's own shop. The standard bicycle wheels

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DO YOUR WORK

Cut your handling costs.
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problem with Rapid-Wheel
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write or wire for money-
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are held in a frame of conduit welded to the frame of the box, which is constructed of 24-gauge steel with an angle iron frame. A low partition in the box provides space for waste or rags. The hinged lids keep the contents dry in all weather.

A "master tooling dock" has been developed by Leland A. Bryant, consulting engineer for Consolidated Vultee Aircraft Corporation. It is a three-dimensional positioning device, used in constructing the huge tools required in aircraft work, and enables unskilled workmen to accomplish jobs that formerly necessitated the services of veteran toolmakers.

The dock takes the guesswork out of toolmaking by reducing the process of finding three-dimensional locations to a series of simple and precise operations. It can locate any point within its boundaries to a tolerance of .001 inch.

This is accomplished by means of longitudinal, vertical, and transverse "straight edges" moving within a rigid frame—which make the job of locating a point in three dimensions almost as simple as using diagonal straight lines to find the center of a sheet of paper.

R. L. Decker, technician at Todd Pacific Shipyards in Seattle, received honorable mention from the War Production Drive's Board for Individual Awards for a port-

able machine that saves about 40 per cent of the time formerly spent in hand grinding.

The winning suggestion was for a machine for lapping Van Stone flanges. The second day the machine was in operation, the second shift ground in a flange on a piece of nine-inch pipe. The back collar on the pipe end was badly distorted. To grind this by hand takes from 10 to 13 hours. It was done in six by the machine. The other end was normal—taking from six to eight hours by hand—and the machine did the job in three hours and ten minutes. An air cylinder lifts the flange for inspection and adjustment.

Alvin Mikulecky of Thermador Manufacturing Co., Los Angeles, recently won a company tool conservation prize by suggesting that coils in a jig be set at an angle, so that saw teeth would hit the edge of the transformer coil rather than the flat sides.

Navy Seeks Buyers

Legitimate buyers, dealers, etc., are being urged to register with the Navy's Material Redistribution and Disposal Administration, for Navy surplus, salvage, and scrap. The coast offices are at 785 Market St., San Francisco; 210 West 7th Street, Los Angeles; and Exchange Building, Seattle.

Hecla Mine Closes

The Hecla mine at Burke, Idaho, one of the famous old lead and silver properties of the West, has been worked out and closed down after producing more than nine million tons of ore having a gross value of \$81,333,000. Ore reserves had been diminishing for many years and were finally exhausted after drifting and diamond drilling from the 3600-foot level had failed to reveal additional deposits.

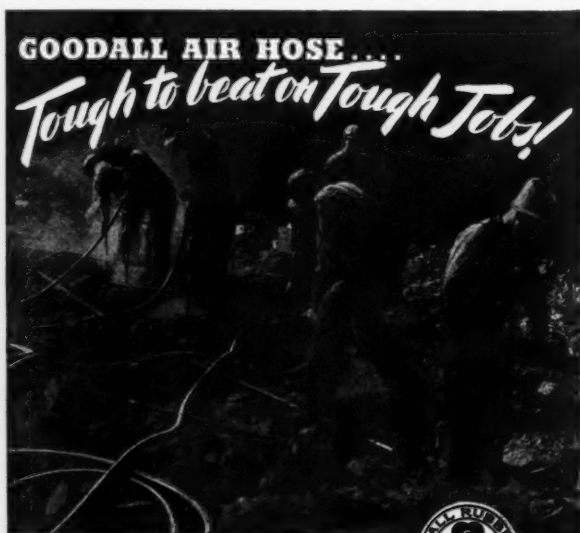
More Tire Makers

Four major tire plants in Los Angeles will get 600 experienced rubber workers from the Army, as part of a nationwide program by the military and the War Production Board to release a total of 1,400 men for vital tire-building jobs. At least another 600 will be required in the near future.

A \$1 million expansion of facilities at the Firestone Tire & Rubber factory in Los Angeles is expected.

Shale Plant Survey

A survey to select a site in the Green River shale formation of Colorado, Utah, and Wyoming for erection of a demonstration plant to make commercial liquid fuels from shale is being conducted under auspices of the Department of Interior.



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Permits any spindle angle ... at any height ... horizontally or vertically.

Simplifies clumsy operations ... speeds production ... eliminates operator fatigue.

Makes burring, sanding, buffing, grinding, angle drilling, polishing, rotary filing, wire brushing, tapping, reaming, honing, etc., more convenient, twice as fast!

Adaptable to all drill presses with tubular columns ... rigid construction ... **POSITIVE LOCKING.** Write now for descriptive literature, details.

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Industrial Picture Of West Presented

ALTHOUGH Senator McCarran's Committee on Industrial Decentralization got no support from the West for its "freeze the East" proposal, the committee hearings in San Francisco in November served a useful purpose in bringing to light considerable information on the general postwar outlook.

Senators McCarran of Nevada and Mudd of Utah, who conducted the hearings, openly voiced their disappointment that the proposal fell flat and that the representatives of leading chambers of commerce on the Pacific Coast asked only for an even break with the East on reconversion of industrial facilities to peacetime production. W. C. Mullendore, vice-president of the Southern California Edison Company and president of the Los Angeles chamber was the most outspoken opponent of the proposal, calling it "absurd and unsound" and promotive of "divisive sectionalism."

On the freight rate question, the opinion generally was that the West was not suffering from any great discrimination by the railroads.

Following is a summary of some of the most important matters presented:

Steel and Other Metals

Dr. J. R. Mahoney, University of Utah, Formula for Geneva.

That the government write off the excess cost of war-time construction over prewar cost as part of the war expense, the purchaser of the mill to pay for only that portion of the mill's facilities which he could immediately use, but if he could use more of it later to pay for that as he needed it.

Alexander R. Heron, California state director of reconstruction and employment.

Fontana and other new basic metal plants stand in the same relation to future economic growth that the transcontinental railroads did—they came ahead of their time. Consequently, desirable that some method be devised of spreading the cost among all the beneficiaries of its operation in the immediate postwar years.

Foster L. McGovern, Seattle Chamber of Commerce.

Seattle interests do not contemplate blast furnaces in that area at this time, but be-

lieve Geneva should be kept intact and freight rates adjusted to plate and structurals can be shipped to Seattle from Geneva to meet Eastern competition. Every effort should be made to have private industry take over Northwest light metal plants and operate them with due regard to unifying the production of pig metal with the manufacturing of specialized forms and sheets. If private capital cannot take over, government-owned plants should be kept intact until light metals economy is fully integrated in the Northwest.

Ivan Bloch, Bonneville Power Administration

Capacity of Spokane rolling mill was not selected with view to postwar use, and doubtful if Reynolds or Olin would be interested in buying it, because it is three times their capacity. Investigating possibilities of using this mill for rolling steel, e.g. stainless sheets.

We believe there should be a stockpile of finished aluminum, otherwise there will be so much surplus no incentive to operate the Northwest plants. Government should spend money to locate alumina deposits closer to the Northwest, and should keep each ingot plant operating until postwar plans are settled, to prevent a shutdown which would result in great cost for starting up again. Same should be done with magnesium. Government should engage in

Here Comes the Hot Coffee



A Welder Gets Hot Coffee at His Work

Hundreds of Industrial War plants serve hot coffee the "AerVoID Way" to workers at their work. Indoors, outdoors or night shift, it's all the same to "AerVoIDs." Coffee prepared in the plant or brought in from outside. Hot coffee anywhere in a big plant is easy with "AerVoIDs" . . . and a great morale-builder. Let us show you how little it costs.

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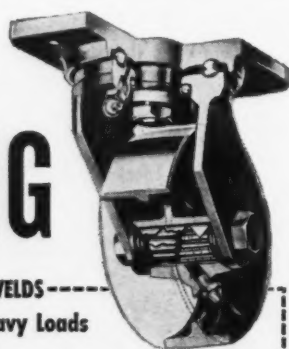
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"AerVoID" Vacuum Insulated Carriers for Storing, Transporting, Serving **HOT COFFEE**

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That's Why Service **FORGEWELDS**-----
Stand Up Under Heavy Loads

Long life and high load-ability of Service Heavy Duty **FORGEWELDS** is the result of **UNBREAKABLE CONSTRUCTION**: 1/4" top plate and 1" king bolt integrally forge welded from a **SINGLE PIECE** of SAE 1045 carbon

steel. These rugged casters carry from 3 to 4 tons per set of 4 on Hyatt or Timken roller bearing wheels. Wheel sizes, 3 3/4" to 8" diameter. Machine-faced Ni-Steel-Iron or Service Molded Plastic Wheels for floor protection.

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Don Fry, manager, Spokane Chamber of Commerce.

Our aluminum reduction costs lowest of any Defense Corporation plant, 12c lb. Rolling mill also efficient.

Shipbuilding

Rear Admiral C. H. Wright, 12th Naval District.

Increasing demands from the Navy and any reconversion now harmful. Post-war naval establishment on West Coast will be three or four times prewar size. Employment in navy yards and other plants serving the navy will be at present level for at least a year after end of the war with Japan. After the war can do much work on the fleet not possible while war is on.

Harvey Klemmer, executive secretary, U. S. Maritime Commission's committee on Postwar Planning.

Maritime Commission plans call for at least two major repair yards on this coast, Swan Island at Portland and Kaiser No. 3 at Richmond. Moore Dry Dock Company at Oakland also being expanded to handle repairs, and possibility that major repair yard will be maintained at Los Angeles. Plans now under way give San Francisco area repair facilities amounting to more than half of those available in what has hitherto been the home of the repair business—New York. U. S. Maritime Service Officers School at Alameda, Calif., will be continued. Not much new postwar ship construction in sight. West Coast yards have 6 per cent differential in bidding.

Reconversion

J. A. Folger, vice chairman for field operations, WPB (formerly Pacific Coast regional director).

Cutbacks will be somewhat less in percentage for the Pacific Coast than country as whole, but will permit substantial amount of reconversion before the end of the war. Cutback blow will be softened, and at same time war workers will be assured of peacetime opportunities. Number of applications per thousand of population for spot authorizations higher than national average, and in the No. 1 critical manpower areas on the coast the percentage of applications approved is twice as big as for the remainder of the No. 1 critical areas in the country.

Thomas Burtch, regional director, Smaller War Plants Corporation.

To afford relatively small enterprises, particularly on the West Coast, to create adequate reconversion reserves, exemption of \$500,000 annual sales made in last amendment to Renegotiation Act, should be increased to \$2,000,000. As reconversion will develop last on the West Coast, plants out here should be permitted to signify their specific needs for war surplus material, machine tools and production

items at same time as rest of country and these surplus items be earmarked and held in reserve for them. Surplus metals that might imperil market for West Coast magnesium, aluminum and steel be withheld from West Coast markets. When war with Japan ends, broad program of research and experimental engineering should be provided for the airframe companies to the end that they may be wholesomely maintained against future sudden needs.

Rex Nicholson, managing director, Builders of the West.

Western war plants should be permitted to divert small portion of their technical

labor and plant capacity to design and development of postwar products. Incentive taxation should be provided for risk capital invested in new enterprises.

Industrial Technology

Chas. W. Merrill, supervising engineer, San Francisco office Bureau of Mines.

Helium development by Bureau of Mines the most spectacular achievement. Inclusion of manganese in the alloy for war-time five cent pieces made them suitable for slot machine use because electric resistance higher and counterfeits rejected

(Continued on Page 60)



Magnet for "Impulse-Buying"

Marketing experts' estimates on the amount of retail sales brought about by "impulse buying" run as high as 25% of all purchases!

That means that smart packaging—topped by effective and attractive closures, is making undreamed-of extra sales for some manufacturers. If you want to be sure of getting your share of this business, call in your I. F. SCHNIER closure specialist soon. His unbiased recommendations may add a profitable new touch to the key sales point in your packaging.

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- * Bottle Wraps
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MOST COMPLETE LINE OF CLOSURES IN THE WEST



INDUSTRIAL PICTURE (From Page 59)

more easily. Bureau of Mines process enables use of certain low grade Western deposits. Pilot plant electric steel furnace being established at Shasta Dam.

C.E.D. Statistics

Earl Fisher, vice-president, Pacific Gas & Electric Company.

1. Communities in California organized under C.E.D.: 90

2. Postwar employment intentions by industry for State of California: (Less shipbuilding and aircraft):

a. Actual reports of sample:

Number of Firms.....	548
1940 Employment.....	111,719
Anticipated 194x Employment.....	133,119
Percentage increase.....	19.2%
(Excluding Los Angeles the increase is 33.5%. Los Angeles represents an increase of 10%.)	

b. Projection for total employment, excluding shipbuilding and aircraft:

Number of Firms.....	12,400
1940 Employment.....	360,338
Anticipated 194x Employment.....	432,405
Percentage increase.....	20%

3. Shipbuilding and Aircraft:

	Shipbldg.	Aircraft
1940 Employment.....	9,919	56,708
Present Employment.....	333,645	312,745
Anticipated Employment one year after close of war.....	33,363	62,550
Percentage reduction.....	20%	80%

Idaho Starch

C. J. Strike, president, Idaho Power Co.

Idaho now producing 40 per cent of potato starch used in the country, which textile and paper mills have substituted for the former imported tapioca. Peace-time problem to hold markets developed in war time for agricultural products. Research being conducted on plastics from pea pods and lodge pole pine.

Rising Thermometer

Bank of America has produced one of the most graphic presentations of the growth of California from 1900 to 1943 that has yet come to hand. It is on the inside of a brochure entitled "Pacific Coast Markets," and is in the form of a thermometer in which the mercury is composed of the state's population. By revolving a disk the population is shown rising in five-year periods to nearly eight million in 1943. Other striking charts show the growth in factory equipment, earnings and output.

G E Plastics Plant

General Electric's postwar plant to be erected at Anaheim, California, will produce plastics largely for the aircraft industry. E. O. Shreve, vice-president of the company, reported on a recent visit to Los Angeles. Heavy equipment will be manufactured at the proposed San Jose plant.

Oldsters Take Well to Oregon Safety Course

REFUTING the adage that "you can't teach an old dog new tricks," the majority of Oregon industrial workers who completed the 1944 series of five lessons in safety training conducted by the Accident Prevention Division of the Oregon State Industrial Accident Commission were "old-time" loggers and sawmill workers. These "students" were in full accord with the slogan that "safety always pays all ways."

When the commission revamped its safety department a year ago with the selection of Robert M. Evenden as director and increasing the field staff of 22 trained men, it was decided to emphasize the "education" cornerstone of the three "E's" of safety work. Three men were trained to conduct industrial safety training classes for employees under the Oregon Workmen's Compensation Act. Each course consists of five two-hour lessons held weekly for five consecutive weeks. A total of 1140 industrial workers representing 108 firms completed the 86 series of lessons.

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The definite objective of the course is to train leadership in accident prevention work through the organization and proper functioning of a safety committee. The five lesson subjects are: "The Accident Problem," "Determining the Causes of Accidents," "Guarding Physical Factors," "Correction of Unsafe Acts" and "The Safety Committee."

Indicative of the scope of each lesson is the breakdown of the first:

- Accident Facts, National and State
- Costs of Accidents
 - Social
 - Economic
 - Hidden
- Frequency
- Severity
- Responsibility for prevention of accidents
 - Management
 - Foremen
 - Employees
 - The Union
 - The Safety Committee

During the course, studies are made of accident and plant investigation reports and a definite period given over to job analysis. Each enrollee participates in the panel discussions and written quizzes.

A study of commission records covering the last six months shows a reduction of frequency or severity of firms whose employees have graduated from the safety training schools. Some firms are outstanding in their reductions, the Springfield Plywood Corporation having reduced their

• "A lesson in time saves nine." Industrial workers of the Oregon-American Lumber Corporation, Vernonia, Oregon, in attendance at one of the safety training classes conducted by the accident prevention division of the Oregon State Industrial Accident Commission.

January frequency rate of 100.0 to a "no accident month" in May.

Semi-annual reports on all firms under the Oregon Act for the first half of this year show an increase of 2.52 per cent in man days worked and a reduction of 3.52 per cent in claims filed and a reduction of

12.5 per cent in fatalities compared to the same period of 1943.

Follow-up work with safety committees organized at the conclusion of a safety training class is a definite part of the progressive program of the Accident Prevention division of the commission.



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LABOR

AND THE INDUSTRIAL WEST

BECAUSE the National War Labor Board's "basic steel" decision of November 25, 1944, can be expected to become national wage policy for industry in general, the San Francisco Employers Council has issued an analysis of the decision and its implications. It was prepared by Wm. H. Smith, director of the council's department of research and analysis and formerly chief analyst for the 10th Regional War Labor Board at San Francisco.

An abstract of some of the more important implications is given as follows:

General wage adjustment. Present policy indications are to "hold the line" on straight hourly rates until the end of the European war. WLB's Mitchell Committee report verified accuracy of Bureau of Labor Statistics index as a measure of price changes for goods purchased by the bulk of wage earners. These showed that while

national living costs were rising 29 per cent or 30 per cent:

- (a) urban hourly wage rates rose 28 per cent.
- (b) gross weekly earnings rose to 71 per cent over January 1, 1941 levels, and
- (c) that out of this 71 per cent increase in weekly earnings a family of four persons had a net "spendable" increase of 47 per cent.

Notwithstanding these indications of present policy, further indication of things to come is seen in the President's remark at a recent press conference that the tendency will be to keep "take home" wages at wartime levels when hours are curtailed. On this point he referred to the significant statement made by Charles E. Wilson, president of the General Electric Company, in a letter to the company's employees, that industry must be "courageous enough" and "smart enough" to assure workers that postwar "take home" pay on a 40-hour week basis must reflect the prevailing higher level of earnings and that

prices must be held in line during the critical months following the close of the European war.

Military severance pay. Action of WLB denying unions proposal for establishing fund for steel workers in the armed forces affirms previously established policy on severance that except under special circumstances WLB has not granted this demand in dispute cases.

Guaranteed annual wage. Reasons for denying this are that the union's demand in its present form would, if granted, subject the steel industry to such serious financial risks, notwithstanding the "carryback" and other provisions of the tax laws as to be unworkable. Confirms policy in several previous cases.

Vacations. Decision for one week after one year and two weeks after five years, despite a clear industry practice to the contrary (one after three), is in accord with its previous criterion of a "reasonable vacation plan." Apparent that Board will justify any case in which the Board has ordered one after one and two after five or any case in which the Board orders something more or less favorable due to the circumstances of the case. As a matter of practice, WLB has almost universally ordered one after one and two after five in disputed cases except where the practice in the industry has been more favorable.

Dismissal or severance pay. In its directive order for both parties to negotiate in

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the hope that mutually agreeable plans could be obtained, the Board stated that it would be fair and equitable if some of the savings from more efficient operations were to be devoted to severance pay, and further, that such a payment would be consonant with the carry-back provisions of the tax laws.

Among the specific provisions that the Board believed should be agreed to were the eligibility of employees, the amount of severance pay benefits, the circumstances under which the benefits would be paid, the transfer of employees to other suitable employment, and the relation to existing pension and retirement plans. The Board stated that particular regard should be given to regular working forces rather than employees who have entered the industry for temporary war service only.

It is significant that the Board's decision is restricted to dismissals resulting from postwar conversion and does not relate to ordinary technological displacements incidental to peacetime improvements on machinery and processes.

Sick leave. Unless industry practice in the area is not to the contrary, the Board will not approve sick leave in dispute cases except under the most extraordinary circumstances.

Night shift differentials. Board's order of premium rate of 4c an hour for the second shift and 6c for the third shift is one of the most important policy making decisions in the case. Heretofore granted only when base hourly rates for all workers do not incorporate compensation for shift work, so it must be assumed that the Board's policy on night shift differentials has become more generous than before. Chairman Davis, asked in a press conference whether this was a change in Board policy, said: "The Board's action on this issue is the result of a gradually developing policy on night shift differentials in continuous operations industries. The Board has long recognized the equity in favor of added compensation because work on the relatively undesirable extra shift is a real increase in job content."

This is particularly important for industries operating during peace time for technical reasons on a "round the clock" basis. They will have added a permanent cost factor, whereas industries which now pay shift differentials as an incident to expanded war time schedules, will avoid the cost under normal operating conditions.

Holidays. Time and a half for all hours worked on holidays.

Geographical wage differentials. Refusal to eliminate these affirms previous Board policy.

Establishment and adjustment of rates for mechanical and maintenance occupations and learner's rates. Previous policy not altered to any appreciable extent, that it is management's function to establish a

(Continued on Page 66)

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THE WESTERN OUTLOOK...NEWS...STATISTICS...

THE PICTURE

With spot authorizations stopped and all thought of any reconversion to civilian production abandoned in view of the gravity of the war situation in Europe, attention now focuses entirely again on war production. Manpower shortage seems to have resulted in decreased production only in the case of copper. Lumber output was up, deliveries of attack transports boosted the shipyard report, iron ore shipments rose sharply. Aircraft poundage was down slightly, because of the trend toward heavier ships, and carloadings declined, probably because of the ending of the crop seasons.

Lumber—Increased Strain

War demand for West Coast lumber put increased strain on the industry in November, which brought Central Procuring Agency purchases of 214 million board feet—approaching three times the October volume of 80 million feet. Thus, after trial steps on the primrose path of reconversion, the West Coast lumber industry is again on the hard road of war work, with the certainty that victory on both fronts lies a long way ahead and that tremendous amounts of lumber will be needed at every stage.

The new war requirements include several very urgent items—large quantities of the best grade of Douglas fir for truck bodies and very

large and unexpected orders for crossarms for the Signal Corps. Pacific naval installations, beachhead construction, lumber stockpiles for future needs, lumber for boxes and crates to carry an unslackened flow of supplies overseas—these military uses are yet another phase of the problem. Government requirements are causing the industry to reconvert back into board production, as it was last spring.

Loggers are now entering the normal annual period of low production and are praying for an open winter.

Cumulative figures for 43 weeks in 1944 and previous years in thousands of board feet reported by the West Coast Lumbermen's Association are as follows:

	1942	1943	1944
Production	8,060,194	7,349,137	7,365,570
Orders	9,520,578	7,749,714	7,685,023
Shipments	8,099,860	7,529,889	7,378,500

Western Pine Association figures covering Idaho White pine, Ponderosa pine, Sugar pine and associated species for the current year to December 2 are as follows:

	1943	1944
Orders	3,851,041	3,689,182
Shipments	3,923,709	3,666,154
Production	3,641,373	3,494,662

Oil—Supply Increasing

Crude oil production in the Pacific Coast territory decreased 8,000 barrels daily in October while total deliveries increased 43,000 barrels daily. However, total supply continued to exceed total deliveries and 14,000 barrels daily were added to storage. Crude run to stills and cracked reached the very high total of 825,000 barrels daily, resulting in a drift on crude stocks of

16,000 barrels daily. Distillate fuel oil stocks increased 18,000 barrels daily and gasoline stocks increased 7,000 barrels daily.

Total demand (domestic demand is not available for publication) for all products for the eight months of 1943 and the first ten months of 1944, is shown below.

	All Products (Bbls.)	1943	1944
May	852,000	900,000	
June	973,000	969,000	
July	918,000	884,000	
August	983,000	883,000	
September	992,000	902,000	
October	987,000	945,000	
November	962,000		
December	1,022,000		
Jan.-Oct. Average	888,000	950,000	

Aircraft—Fewer But Bigger

Pacific Coast aircraft production for November showed another drop in the number of planes delivered but the poundage was off only slightly, reflecting the concentration on heavy ships. Figures from the Western Procurement District, Air Technical Service Command, are as follows:

	No. of Planes	Total Poundage
January, 1944	2,359	31,892,000
February	2,569	32,469,000
March	2,703	36,015,200
April	2,295	30,993,000
May	2,569	34,234,000
June	2,276	32,284,500
July	1,890	26,909,100
August	1,930	26,391,000
September	1,802	26,293,000
October	1,609	21,960,000
November	1,499	20,821,000

Figures beginning July, 1944 are for planes reported complete after modification, instead of on leaving factory, as previously.

War Production Contracts—October a Light Month

In Thousands of Dollars—Source: War Production Board Statistical Division

NOTE: The monthly award figures shown below represent only an approximation of the actual contracts, because cut-backs and cancellations are usually on previous awards, although reported in the current month. Also there is considerable lag in the reporting of individual contracts. However, WESTERN INDUSTRY is reporting the monthly awards by the successive subtraction method as an approximation.

	MONTANA	IDAHO	WYOMING	COLORADO	N. MEX.	ARIZONA	UTAH	NEVADA
	All Other	Ships	All Other	All Other	All Other	All Other	All Other	All Other
January	...	...	370	1,280	...	112	66	...
February	1,584	...	53	7,858	...	208	175	...
March	34	...	50	602	...	203	...	...
April	...	...	...	13,090	...	...	660	...
May	...	...	121	12,638	...	...	53	...
June	...	...	...	12,853	...	...	...	...
July	2,114	...	...	10,558	...	...	...	...
August	4,282	...	...	2,556	...	...	...	...
September	211	141	220	2,998	...	...	...	...
October	135	...	329	1,016	...	...	...	...
Total from June, 1940	13,985	707	5,422	38,484	1,828	3,739	94,946	9,427

	WASHINGTON			OREGON			CALIFORNIA			TOTAL		
	Aircraft	Ships	All Other	Aircraft	Ships	All Other	Aircraft	Ships	All Other	Aircraft	Ships	All Other
January	....	1,549	23,782	...	7,803	12,600	2,390	280,712	46,041	2,390	290,176	211,463
February	....	94,257	74,558	....	6,602	760	221,910	142,683	20,174	221,910	233,509	34,586
March	....	226,602	16,553	....	3,136	5,133	397,502	42,828	79,517	406,748	266,175	64,831
April	490,785	40,671	9,235	....	6,511	14,297	698,106	13,609	75,277	1,188,891	61,340	117,263
May	....	12,082	6,785	....	39,430	10,088	525,545	11,933	19,835	524,942	93,948	1,280
June	....	153,182	23,865	....	102,046	2,288	280,488	121,304	102,759	290,688	377,332	149,532
July	145,057	158,458	21,849	....	14,897	3,611	203,772	65,000	241,266	349,492	238,417	287,072
August	714,598	13,227	119,172	....	28,607	15,206	189,082	108,152	12,134	903,890	150,993	616,675
September	82,689	6,287	10,088	....	2,081	5,057	122,840	44,758	32,083	295,681	53,608	116,685
October	....	15,877	14,475	....	171	805	169,020	13,111	40,631	169,070	30,020	59,383
Total from June 1940	1,885,837	2,071,759	303,543	1,033	1,272,994	139,423	9,818,874	4,403,106	1,581,453	1,906,161	7,669,329	2,183,449

Electric Energy—Second Month of Decline

Production of Electric Energy for Public Use—In thousands of Kilowatt Hours—Source: Federal Power Commission

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Mtn.	Washington	Oregon	California	Total Pac.
January, 1944	223,298	94,952	19,417	96,960	42,346	290,005	57,904	331,055	1,555,925	964,314	496,851	1,281,484	3,652,949
February	302,057	84,639	18,023	87,611	37,881	291,989	50,490	314,546	1,087,226	928,634	376,321	1,200,331	3,506,389
March	312,801	104,566	18,222	89,928	40,994	286,847	46,275	324,633	1,124,866	945,129	492,195	1,322,532	3,668,186
April	189,958	122,178	18,793	85,954	42,287	284,140	33,462	262,097	1,038,849	890,599	370,914	1,375,445	3,635,998
May	190,926	112,473	19,454	87,365	41,077	297,189	38,291	284,064	1,071,379	854,064	417,654	1,397,484	3,669,288
June	191,704	104,360	22,260	84,548	42,172	285,599	38,255	271,433	1,071,529	864,031	417,654	1,401,465	3,639,559
July	217,474	127,101	24,459	87,399	44,306	331,454	24,390	256,538	1,113,121	779,929	438,373	1,521,569	2,739,871
August	230,673	128,274	30,999	91,641	47,468	357,053	25,137	272,598	1,173,843	781,757	466,110	1,451,720	2,899,587
September	192,753	105,577	23,160	88,678	42,763	343,750	24,431	229,951	1,051,249	780,323	386,453	1,304,797	2,471,573
October	202,734	81,574	18,231	92,809	41,832	354,905	30,937	236,822	1,059,844	811,273	389,872	1,238,374	2,439,519

FROM THE RESEARCH DIVISION OF WESTERN INDUSTRY

Employment—Eleven Western States

Estimated Number of Employees in Non-Agricultural Establishments—In Thousands—Source: U. S. Bureau of Labor Statistics

ALL INDUSTRY DIVISIONS

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Mountain	Washington	Oregon	California	Total Pacific
January, 1944	110	95.0	60.6	265	76.4	108.4	150	40.4	906	644	334	2,635	3,613
February	109	94.1	60.8	265	76.8	108.6	147	40.0	901	638	333	2,629	3,600
March	109	95.5	59.4	259	76.4	108.2	142	39.9	889	636	332	2,605	3,573
April	110	94.7	59.9	259	77.5	108.7	145	40.6	895	633	330	2,614	3,577
May	110	95.6	61.8	262	78.2	107.9	145	41.5	902	632	331	2,590	3,553
June	111	95.6	63.3	264	79.1	107.6	144	41.4	906	637	337	2,581	3,555
July	110	95.1	62.6	265	79.5	107.0	155	41.6	916	645	336	2,599	3,580
August	110	94.1	62.9	264	79.7	105.9	154	41.5	912	643	342	2,617	3,602

MANUFACTURING

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Mountain	Washington	Oregon	California	Total Pacific
January, 1944	13.9	12.8	3.7	53.7	4.8	15.9	22.4	4.6	132	267	130.1	1,016	1,422
February	13.8	12.6	3.8	53.5	4.8	15.4	20.8	4.5	129	264	136.6	1,008	1,409
March	13.7	13.0	4.0	47.9	4.8	15.7	18.8	4.2	122	262	134.9	987	1,384
April	13.4	13.2	4.2	46.4	4.9	16.4	21.1	3.8	123	255	131.2	978	1,367
May	13.3	14.2	4.1	47.2	4.8	16.3	21.8	3.4	125	255	132.5	954	1,342
June	13.3	15.0	4.4	48.0	5.0	17.0	23.1	3.2	129	259	136.4	934	1,329
July	13.1	16.0	4.4	49.2	5.1	16.4	34.2	3.0	141	268	137.1	953	1,358
August	13.2	14.3	4.7	47.7	5.1	16.9	33.0	3.0	138	264	141.6	964	1,370

As the result of seasonal contraction in fruit and vegetable canning and reductions in durable goods industries, the factory force of California manufacturing industries decreased to 795,100 in October, down 25,700 from September and 120,800 from a year ago, according to the California Division of Labor Statistics. The production force for this October was the smallest in 24 months.

Durable goods industries were down 11,300 from September and 154,900 from the August 1943 peak of 729,500.

Aircraft plants had a factory force of 161,400 in October, 4,100 below September. The October level was off 34 per cent from the April 1943 peak of 244,700. Despite the decrease in aircraft employment, one out of every three factory workers in the Los Angeles area this October was engaged in making airplanes. Shipyards (excluding government yards) employed 224,600 wage earners in October, a decrease of 4,100 from the preceding month and of 55,100 from a year ago.

EMPLOYMENT—DURABLE GOODS INDUSTRIES

(Figures from Calif. Div. of Labor Statistics)

	San Francisco Bay Area	Los Angeles Indus'l Area	Total State
Jan. 1944	221,200	369,200	698,800
February	218,600	363,600	689,600
March	212,100	354,700	670,900
April	205,000	347,900	655,700
May	202,200	359,400	645,100
June	196,700	325,500	625,400
July	192,000	320,900	616,700
August	189,200	315,700	605,400
September	188,500	301,400	585,800
October	184,300	295,800	486,100

a big upward jump due to completion of AT-5s which were worked on in the summer months. Most of the yards are now returning to Victory cargo ships, which can be built in much faster time than the transports, but on the other hand the Victories do not carry as high priorities as the AT-5s. The latter were given top ratings. The lower priorities may affect the employment situation, which has remained about stationary for several months. In some of the yards in the Portland area payrolls actually increased about 10 per cent while the AT-5s were being pushed through. November deliveries shown below do not include a concrete barge and a steel derrick barge. Fifty keels were laid.

	Launchings Ships	Deliveries Ships	Thousands of Deadwt. tons
January 1944	76	67	633
February	59	59	585
March	61	73	679
April	66	64	641
May	60	72	693
June	50	55	516
July	58	38	399
August	41	32	295
September	46	44	407
October	56	51	401
November	54	60	489

(Includes destroyer escorts and small aircraft carriers, but not larger naval vessels built by the navy itself. Also includes concrete barges, but not tugs or wooden barges. Tonnage figures from September on are adjusted, previous months unadjusted. Deadweight tons are used as a rough measure of the cargo carrying capacity of the ship. All figures from U. S. Maritime Commission statistical department.)

Copper—Still Sliding

A single increase in October of 727 tons output from Montana, due to a greater quantity of ore being treated by Anaconda, was offset by a decline in other Western states. Loss of part of the surface buildings by fire at the Inspiration Copper Company mine in the Globe-Miami district cut down Arizona's production. Labor shortage was the general reason for lower output.

Production figures from the Western states, in short tons, are as follows:

	Ariz.	Mont.	Utah	Tot. Western, including other states
Jan.-March	102,224	35,421	79,046	255,624
April	33,967	10,683	24,545	82,822
May	33,832	10,668	24,979	82,108
June	31,369	8,969	23,421	77,964
July	28,067	8,130	22,000	77,964
Sept.	25,683	8,523	21,947	69,115
Oct. (prelim.)	25,500	9,250	21,500	68,212

Freight—Slight Gains

Shippers' advisory board estimates of carloadings for the fourth quarter of 1944 showed increases of 4.4 per cent over the corresponding

year in 1943 for the Pacific Coast board territory and 4.2 per cent in the Pacific Northwest. Manufactures, however, showed a 7.7 per cent gain in the Pacific Coast territory and 14.4 per cent in the Pacific Northwest.

Total traffic figures for the railroads in the Far West are as follows:

	Loadings	Received from eastern connections	Total
March	421,188	320,763	741,951
April	489,777	326,101	825,878
May	505,610	333,480	839,090
June	559,037	333,709	892,746
July	746,085	418,866	1,083,124
August	709,486	404,070	1,113,556
September	755,486	450,180	1,205,666
October	683,830	421,898	1,105,728
November	657,927	425,197	1,083,124

Iron—Bounces Back

October shipments of iron ore in the West showed a sharp upturn in October from previous months, scoring the highest record since last May. Shipments from Utah mines were considerably greater than the intervening months, while the California mines supplying Fontana bounced up from September, but not up to the level of the summer months.

	Utah	Wyoming	Calif.	Total
March	133,901	86,291	54,104	274,296
April	123,417	63,081	49,078	235,576
May	134,733	70,535	34,477	259,745
June	93,699	64,652	63,055	226,406
July	126,514	47,962	60,908	235,384
August	134,742	35,721	32,426	222,889
September	129,586	47,119	32,596	209,301
October	145,157	39,161	54,545	238,863

Pig iron production for the Western area of the United States is reported by the American Iron and Steel Institute in net tons as follows:

	Percent of capacity	Year to date	Percent of capacity
October	155,824	64.7	1,416,538
			66.4

THE TREND

Total employment continues its gradual decline in the West, although the shipyards have not suffered any net loss in recent months, because of the high priorities given attack transports. Beginning the first of the year the yards mostly revert to cargo ships with lower priorities, so there may be a drop both in output and employment. Aircraft production will continue at present levels, or higher, in view of new contracts, and the hard-pressed lumber industry will have to find the means somehow to meet increased demands.

Cement—Below Last Year

Production for the year to date is 40 per cent below last year in the intermountain states, 26 per cent in California and 12 per cent in the Pacific Northwest.

	California	Oregon-Wash.	Utah-Idaho	Mont.
1943	1,561	1,000	446	291
1944	1,740	1,231	446	381
Feb.	1,680	1,317	417	368
March	1,701	1,260	501	323
April	1,597	1,108	474	511
May	1,482	1,312	461	454
June	1,489	1,188	471	421
July	1,469	1,360	502	378
August				382
September				280
October				

Ships—Finishing Transports

As the attack transport program of the Maritime Commission was largely wound up in December, the November output figures from the Pacific Coast shipyards shown below reflect

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LABOR (Cont'd from Pg. 63)

new job classification and to fix the rates for the new jobs, but to the extent that management's actions result in the creation or perpetuation of intra-plant inequities, to that extent management's actions are subject to the grievance and arbitration procedure.

Maintenance of membership and check-off. Major question of under what conditions Board will withdraw its previous award of maintenance of membership and checkoff. Study of decisions makes it apparent that Board has granted union security unconditionally where (a) the strike was not authorized by local union officials and was ended promptly with assistance of local or international representatives, (b) the strike was provoked by management, or (c) the local union authorized the strike under the mistaken assumption that a strike was necessary to get a dispute case certified.

The Board has ordered union security on a conditional basis where it was clear that union leaders were not irresponsible but were unable to control the members, and denied union security where union leaders authorized strikes in disregard of the no-strike pledge. Apparently the Board side-stepped the factual presentation by the companies regarding steel strikes.

Interpretation Of Wilful Misconduct

The California Supreme Court held recently that a corporate employer could not be held liable for serious and wilful misconduct because the foreman of a crane crew whose conduct caused the injury was not considered by the court to have sufficient "general discretionary powers of direction." Under Labor Code Section 4553 the misconduct must be "on the part of an executive, managing officer, or general superintendent" of the corporation.

The foreman in charge of the crane crew was told by his superior to get some pipe from a reclamation yard about a mile away. He received no specific orders as to how the loading was to be done. At the foreman's direction the crane was placed directly under wires which the foreman knew to be high voltage wires. The wires were 35 feet above the ground. The boom of the crane was 60 feet long as then rigged; it could have been shortened but was not. The boom came in contact with the wires and an employee holding a hook attached to it was burned by the electricity.

Alcoa Expansion

"We expect to stay here and we expect to expand," said Arthur P. Hall, chairman of the postwar development committee of the Aluminum Company of America on the occasion of his recent visit to the Pacific Coast. He announced that Alcoa may build another Pacific Coast plant to cost \$20,000,000.

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THE WEST ON ITS WAY

ARIZONA

CONTRACT—Del E. Webb Construction Co., Phoenix, was awarded contract at \$116,740 for the construction of a lunch room building addition to existing school building at Buckeye.

CALIFORNIA

STEEL BARRACKS—United States Steel Export Co., Port Hueneme, has been awarded contract by Navy Bureau of Yards and Docks for 500 units of two-story knocked-down steel barracks for shipment overseas; each is 36 x 168 feet and will cost about \$10,400 each.

ORGANIZATION—Holga Metal Production Co. has been organized by Hugo Tunkl, Myron Hemmerdinger and Sidley Ulrich and has established its operations at 5210 San Fernando Road, Glendale.

COMPANY FORMATION—Atlas Welding & Manufacturing Co. has been formed by T. E. Cranford and A. J. Smoak and has located at 2200 West Pacific Coast Highway, Long Beach.

PLANT ADDITION—Western Brass Works, 1441 Naud Street, Los Angeles, will build a plant addition 25 x 45 feet, costing \$3,000.

EXPANSION PROGRAM—No less than 13 airlines have made application for new or additional facilities and are prepared to spend \$3,000,000 to \$7,000,000 each on new hangars, shops and other facilities at San Francisco's Mills Field Airport, provided San Francisco makes the \$20,000,000 in improvements contemplated under the present bond issue. Pan American Airways' proposed expenditure of \$7,000,000 is the largest figure.

PURCHASE—The Fruit Growers Supply Co. has purchased the town of Westwood and plant facilities of the Red River Lumber Company there for the purpose of assuring growers an adequate supply of boxes for citrus.

ACQUISITION—Dresser Industries, Inc., which already owns Pacific Pump Works at Huntington Park, has through its board of directors approved acquisition of three more Coast concerns, subject to action of their stockholders. The three are Kobe, Inc., maker of oil equipment; Payne Furnace & Supply Co., and Day & Night Manufacturing Co. This acquisition is understood to add possibly \$10,000,000 annual business to Dresser's postwar volume.

CHANGE OF NAME—To reflect more accurately the business of the company, Utility Fan Corporation of Los Angeles has changed its name to Utility Appliance Corporation. Starting in 1925 as manufacturer of ventilating equipment, the Utility organization now produces and distributes a wide range of air cooling, air moving, and gas-fired heating appliances.

WAREHOUSE—Southern Pipe & Casing Co. is building a warehouse 36 x 160 feet at 1753 West Bonita Street, Azusa, to cost about \$5800.

CONTRACT AWARD—Day & Night Flare Corp., Azusa, has been awarded military contract of \$154,386 for signal flares.

ARMY CONTRACT—Western Pipe & Steel Co., 5717 Santa Fe Ave., Los Angeles, was awarded contract for pipe couplings in the amount of \$400,000.

NAVY CONTRACT—Monson Brothers, 475 Sixth St., San Francisco, has been awarded contract by the Bureau of Yards and Docks, Navy Department, amounting to \$439,177 for additional hospital facilities, USN Hospital, Oak Knoll.

CAFETERIA BUILDING—McNeil Construction Co., 5860 Avalon Blvd., Los Angeles, was awarded contract by Standard Oil Co. of California for the construction of a cafeteria building at the El Segundo plant, at a cost of \$200,000.

EXPANSION PROGRAM—In San Jose, the Kaufmann Meat Company is developing an expansion program which is estimated at \$300,000 to \$350,000.

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THE WEST ON ITS WAY

AWARD—A military procurement contract was awarded for human parachutes to Cole of California, Vernon, in the amount of \$505,200.

CONTRACT AWARD—U. S. Army has ordered the Rheem Manufacturing Co., Southgate, to supply gasoline drums in the amount of \$1,600,000.

ARMY CONTRACT—Universal Metal Products Co., 2940 E. Olympic Ave., Los Angeles, has been awarded government contract to supply repair parts and tools in the amount of \$320,400.

AWARD—U. S. Army has awarded contract amounting to \$210,600 for asphalt to Bell Oil & Refining Co., Los Angeles.

ARMY CONTRACT—Byron Jackson Co., Los Angeles, was awarded contract in amount of \$153,028 for centrifugal pumps.

ARMY CONTRACT—Don Baxter, Inc., 1015 Grandview Ave., Glendale, was awarded Army contract for solutions of dextrose and isotonic sodium chloride in the amount of \$153,600.

PLANT—Glass Containers, Inc. has purchased 15 acres of industrial property at Antioch, where it will construct a complete manufacturing plant for production of bottles and food jars.

COMPANY FORMATION—J. & L. Welding Co. has been formed by Jack R. Long and has established its plant at 5020½ South Normandie Ave., Los Angeles.

INCORPORATION—Industrial Pipe Bending & Fabricating Corp. has been incorporated with \$75,000 capital by M. W. Perron and associates, Los Angeles. Archie G. Cope, Ocean Center Bldg., Long Beach, is representative.

NEW CORPORATION—Marquardt Aircraft Co. has been incorporated with \$20,000 capital by Roy E. Marquardt, Hawthorne, and William S. Schneider and William M. Farrer, Los Angeles. Hill, Martin & Bledsoe, 1007 Title Guarantee Bldg., are representatives.

COMPANY ESTABLISHMENT—Capital Welding & Mfg. Co. has been established by Ray J. Alzea and Raymond W. Baker and is operating at 5200 Imperial Highway, Lynwood, Calif.

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BUILDING ADDITION—Gardner Mfg. Co., 2707-11 Union St., Oakland 7, are building an addition to their forging shop and steel warehouse, not a new foundry building as was incorrectly reported in the August issue.

CONVERSION PROJECT—The Kaiser Richmond Shipyard No. 3 will be converted from a ship construction yard to a base for repairing naval war ships and supporting vessels, the Twelfth Naval District headquarters announce. The change will necessitate transfer of construction of five 18,000-ton C-4 type troop transports to the Kaiser Yards in Vancouver, and work planned includes construction of two finger piers, 50 feet wide and 553 feet long, and reinforced concrete docks; a rock-based fill 1600 feet long, and two temporary steel coffer dams.

EXPANSION—General Electric Company plans general expansion of its California plants in the postwar period. In addition to new plants at San Jose and Anaheim, the Oakland and Ontario plants will be enlarged.

ACQUISITION—Dynamic Air Engineering, Inc. has acquired the properties and uncompleted contracts of Steel Forming Corporation, Los Angeles. The original factory at 843 San Julian St. will continue production of axial flow fans and fractional horse-power motors; the newly acquired factory will be engaged on present contracts with several large aircraft corporations.

REMODELING AND ENLARGING—The J. S. Guerin Co., 720 Folsom St., have remodeled and enlarged their office and warehouse.

NEW FACTORY—The Eastman Tag & Label Co. of San Francisco has purchased a ten-acre site for the construction of a new and modern factory just north of the Chemurgic plant on the Giant Highway, the present site of the Parr-Terminal Corporation now engaged in subdividing for industrial purposes. It is estimated that the employee workload will be between 175 and 200 persons, and the new plant will be modernized and expanded from its present operations in San Francisco.

SALE—Sale of the huge Los Angeles Railway Corporation, operators of the major street car and bus line networks in Los Angeles, to the American City Lines of Chicago has been announced and will be effective soon after the new year.

CONTRACT AWARD—M. H. Golden Construction Co., 3485 Noell, San Diego, has been awarded contract by the Navy Dept. for the construction of storehouse at the Naval Air Station, San Diego, to amount to \$480,522.

CONTRACT AWARD—Hal Crumley, 716 E. 5th St., Pomona, has been awarded contract of \$3385.07 by U. S. District Engineer Office, Los Angeles, for the construction of a dehumidification system in the engine treatment room of warehouse at the Army Air Forces Supply Depot in Maywood.

GOVERNMENT AWARD—Ivan M. Wells Construction Co., 201 S. Linden Drive, Beverly Hills, has been awarded contract in the amount of \$4970.45 by the U. S. District Engineer Office, Los Angeles, for the construction of motor pool facilities at the Torrance Station Hospital, Los Angeles Port of Embarkation.

REMODELING—C. L. Hess, 2713 S. Barrington, West Los Angeles, was awarded contract in the amount of \$50,000 by the American Airlines, Inc., 512 W. 6th St., Los Angeles, for the remodeling work necessary for a new ticket office and regional offices on the Sixth Street side of ground floor and 2nd floor of the Pacific Mutual Bldg., 6th and Grand Avenues, Los Angeles.

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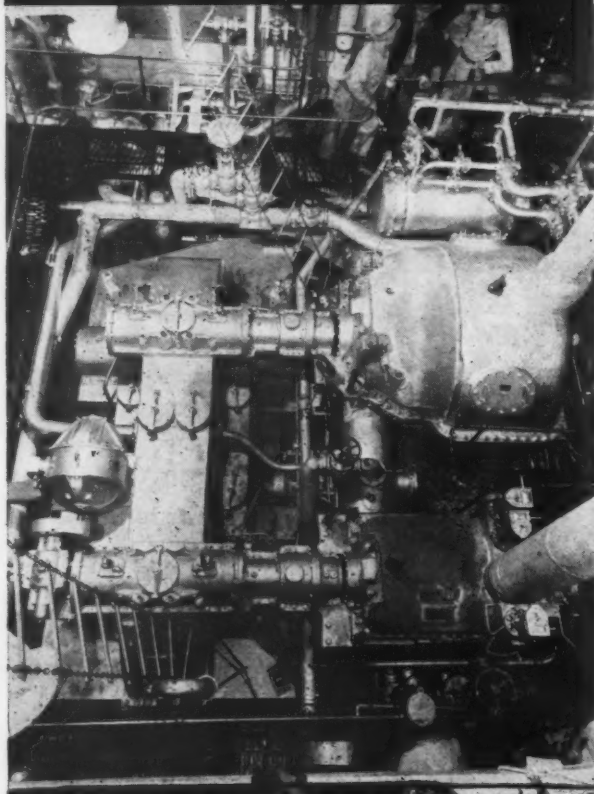
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POSTWAR PLAN—A postwar plan calling for an estimated expenditure of \$450,000 has been prepared by the Chico School District. Of that amount, \$300,000 would cover new buildings and improvements for the high school and the balance for elementary school work.

NAVY CONTRACT AWARD—R. E. Campbell Co., 316 E. Weber St., Compton, has been awarded Navy contract at \$1,357,400 for construction of a 500-bed expansion to the U. S. Naval Hospital at Long Beach.

INSTALLATION—H. M. Keller Co., 4604 Hollywood Blvd., Los Angeles, has the contract for the construction and installation of hangar doors on buildings Nos. 330 and 331 at plant B-6, Burbank, for Lockheed Aircraft Corp., a Defense Plant Corp. project. The work will include structural steel work, sheet metal work, composition roofing, metal covered doors, roller doors and will cost \$74,000.

ARMY CONTRACT AWARD—A contract for \$31,887 has been awarded by the U. S. Army Engineers district office to H. W. Robertson of Sacramento for the construction of an addition to the prefabricated hangars at McClellan Field.

COLORADO

MANUFACTURING PLANT—F. J. Kirchhoff Construction Co., 700 Lawrence St., Denver, was awarded contract by the Gates Rubber Co. in the amount of approximately \$450,000, for the construction of a manufacturing plant. The proposed building will be four stories and basement.

SWIMMING POOL—Mead & Mount Construction Co., Denver National Bldg., Denver, has been awarded contract at \$100,684 by U. S. District Engineer Office, Railway Exchange Bldg., Denver, for the construction of an enclosed swimming pool at Fitzsimmons General Hospital, Denver.

IDAHO

BUILDING—The recently organized Idaho Concrete Pipe Co. will begin construction on a 80 x 80-foot one-story structure on Coldwell Blvd., Nampa, costing about \$6,500; and the equipment for the plant is estimated at \$30,000.

The SMALL hoist with the BIG hoist features

The Titan is a compact, lightweight, electric hoist; easily installed, simple to operate. It is inexpensive to buy, costs practically nothing to operate, handles loads up to 750 pounds; is fast and makes handling safer for both men and materials.

Ask for further information on this time saver and production increaser; also for Titan Bulletin 801.

Titan ELECTRIC HOIST

- 1 Trolley Suspension for travelling on a monorail.
- 2 Hook Suspension—hang up and use anywhere.
- 3 Plug In—use single phase lighting current; but made also for multi-phase power.
- 4 Cone Drive—continuous contact, the latest in worm gearing.
- 5 Push-Button Control; quick, convenient and safe.

**DETROIT HOIST
& MACHINE CO.**
8215 Morrow Street
Detroit 11, Mich.

NEVADA

FOUNDRY—Under the company name of Nevamag, Earl Magee, Dr. J. H. Bradford, Harry Giffen and E. E. Jones have leased the Midway Casino at Pittman between Basic Magnesium and Las Vegas and will open a magnesium foundry. Later they will build uptown.

NAVY CONTRACT—Carrier Corporation, 625 Market St., San Francisco, has been awarded Navy contract at \$200,000 for air conditioning permanent inhibiting building at the Naval Air Depot at Hawthorne, Nevada.

OREGON

NAVY CONTRACT—Brennan & Cahoon, Klamath Falls, has been awarded contract by the U. S. Navy for the construction of additional facilities at the marine rehabilitation center, Klamath Falls, in the amount of \$1,026,833.

SAWMILL—Construction of a new sawmill for the Mount Jefferson Lumber Co. is now under way, with Biremeier & Saemal, contractors, in charge. The company's sawmill was destroyed by fire during the summer.

EXPANSION—Officials of the new firm in Bend of the Oregon Trail Furniture Shops, headed by J. S. Sammons of Portland, have revealed plans for the extensive development of the Bend plant.

GOVERNMENT CONTRACT—Northwest Fabricators, Albany, was awarded contract at approximately \$430,000 by the South Atlantic Division, U. S. District Engineer Office, Atlanta, Ga., for the furnishing and packaging of 800 units of pre-cut tropical barracks, 20 x 48 ft., one-story each, for overseas shipment.

PLANING MILL—J. G. Vincent and associates of Aloha have purchased from the city of Hillsboro a site for construction of a planing mill, dry kiln and shingle mill expected to cost from \$20,000 to \$25,000.

REPAIR SHOP—A. Grotenhuis and H. A. Hemmingsen, 506 W. Seventh St., Albany, are to construct a farm equipment repair shop at Albany at an estimated cost of \$18,000.



The place Forgings assume in the transition of steel to the useful weapons of war demands exacting production schedules. That we have upheld and even bettered these requirements is a source of gratification to all of us. The recognition of the Armed Forces in the form of Production Awards, of which there has been 22 to date, is an achievement of which we are all very proud. This "Know How" dating back prior to the last World War will, when the victory is won, again be a valuable contribution to the postwar period.



RIGID New Extra-Long-Taper PIPE REAMER



★ Doesn't thin pipe wall

★ Reams only the burr

★ Does the job easily



● With easy feather-light ratcheted strokes of this new reamer you whisk the burr from any pipe—but *only the burr*. For the extra-long taper of this **RIGID** tool keeps you from thinning pipe or conduit wall, prevents splitting or flaring. You save work—and pipe. It's complete with ratchet handle—or you may buy reamer unit only, for use in your **RIGID** 00R threader handle. Try this smart reamer—at your Supply House.

THE RIDGE TOOL COMPANY • Elyria, Ohio





NEW Model "U" *Full-Revolving* HANDI-CRANE

● HERE'S the heavy duty load lifter and transporter you've been waiting for... a husky full-revolving tractor crane that handles heavy loads with ease, travels anywhere in the plant or yard, cuts hours and dollars off your materials-handling costs.

EASIER STEERING under heavy loads with exclusive new extra-heavy front end construction.

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THE WEST ON ITS WAY

UTAH

SHOP ADDITION—M. Morrin & Son, Salt Lake City, was awarded contract by the U. S. Engineer Office, 500 State St., Salt Lake City, for the construction of an addition to Brace Shop at Bushnell General Hospital, near Brigham City, in the amount of \$16,900.

WASHINGTON

IMPROVEMENTS—The War Production Board has issued priorities for improvements costing \$110,000 at the Spokane and Vancouver plants of the Aluminum Company of America. The work at the Vancouver plant consists of the installation of a system to eliminate the escape of dust and gas, which will involve the sinking of two wells and the installation of two pumps, costing \$110,500. The Spokane plant will install unit heaters to provide forced cooling on screwdown motors of hot mills at an estimated cost of \$1,110.

ADDITION—At a cost of about \$14,000, an addition 109 x 54 feet in area will be constructed adjoining the machine shop of the Washington Iron Works at 1500 Sixth Ave., Seattle.

WAREHOUSE AND OFFICE BUILDING—West Coast Grocery Co. has announced the purchase of five acres of ground on Railroad Avenue, Tacoma, where it will erect a 2-story 200 x 700 warehouse and office building at a cost of \$300,000.

ADDITION—An addition to the machine shop structure of Peter Ivanoff at 420 W. Canal Street, Seattle, is planned at an estimated cost of \$3,000.

PLANT ADDITION—The Burke Millwork Co. at 3201 Fremont Ave., Seattle, has completed plans for the construction of a frame storage and assembly building at their plant. The building is to be 189 x 64 feet in area and will cost about \$20,000.

SHOP ADDITION—A frame addition 60 x 40 feet in area and estimated to cost about \$3500 will be constructed adjoining the main shop building of the Hydraulic Supply Co. at 7500 Eighth Ave. S., Seattle.

CONTRACT AWARD—Thurburn & Logozo, 4608-36th St. S.W., Seattle, have been awarded government contract for construction of a cadet nurses' home for the Virginia Mason Hospital, Seattle.

SHINGLE MILL—Construction of a shingle mill at 1825 E. 11th St., Tacoma, to cost \$5000, will be built by J. E. and J. A. Squires.

RECONSTRUCTION—Polson Lumber Shingle Co., Hoquiam, plans to rebuild two dry kilns recently destroyed by fire at mill B, at a cost of \$5,500.

SHOP BUILDING—O. B. Daniels, Orpheum Bldg., Seattle, has been authorized by Todd Seattle Shipyards, Inc., to proceed with the construction of a \$14,500 frame shop building at Plant B, 2400-11th Ave. S.W., Seattle.

ELEVATOR ENLARGEMENT—The Myrick Elevator Co. will construct a 100,000-bushel capacity addition to its grain elevator at Myrick station, costing between \$25,000 and \$30,000. Guy Hugunin of Pendleton has been given the contract.

Additional Spot Authorization For Reconversion to Civilian Production

San Francisco

Duart Mfg. Co., Ltd., permanent wave machines.
Max Hoefner, brass embossing dies.
Master Baker Oven Mfg. Co., revolving tray ovens.
San Francisco Bedding Co., box springs.
Shreve & Co., silver-plated holloware.
Sleep Craft, Inc., box springs.
Specialty Mfg. Co., inner spring mattresses.
States Batteries, Ltd., of No. California, replacement storage batteries.

Other Northern California

Berkeley—Associated Industries, steel incinerators.
" Ambassador Venetian Blind Co., steel slat venetian blinds.
" Skewis Sound Systems, electric heaters, portable.

Oakland—Hoyt Heater Co. of No. Calif., gas-fired stor. water heaters.
 Empire Foundry Co., Inc., indoor fireplace equipment.
 Joslin Mfg. Co., dual sleeping equipment.
 American Tractor Equip. Co., land planes, farm machinery.
 Malsbary Mfg. Co., steam vapor cleaners.
Fresno—Buckner Mfg. Co., mechanical sprinkle and accessories.
 Price Welding Co., farm scrapers.
Lodi—Werner's Mfg. Co., safe deposit boxes and utility metal filing cabinets
Modesto—Frank J. Hudson, water well casing
 Miller Mfg. Co., Miller feed mill
 H. C. Shaw Co., drawbars for wood bar harrow sections
Stockton—Moore Equipment Co., orchard ridgers and disc harrows
 Harris Mfg. Co., broadcast seeders
San Jose—Western Mfg. Co., hydraulic automobile lifts
 Western Pump Co., Inc., deep well turbine pumps
Watsonville—P. J. Freimuth Co., water well casing

Los Angeles

Diamond Mattress Co., box springs.
 Premier Bed & Spring Co., box springs, innerspring mattresses.
 Bailey Schmitz Co., box springs, dual sleeping equipment.
 Rose-Derry Co. of Calif., innerspring mattresses for infants' cribs.
 The Edan Co., innerspring mattresses.
 C. P. Tenold, metal storage cabinets.
 The Inco Co., coil and box bed springs and innerspring mattresses.
 Hudson Mfg. Co., metal household furniture.
 MacMillen Mfg. Co., cake turners, spatula type.
 Holloway Machine Shop, lawn sprinklers.
 F & W Foundry, aluminum cooking utensils.
 Los Angeles Bedding Co., innerspring mattresses.
 Aerco Corporation, pumps (tire, hand).
 Electrical Products Corp., metal signs.
 Hammel Radiator Engineering Co., portable barbecue stove.
 Shaw Machine & Tool Co., plate making equipment.
 20th Century Lites, Inc., neon signs.
 Aircraft Specialties Co., towel, shoe, and hosiery racks.
 Hudson Plating Works, spoons.
 Poulson & Nardon, Inc., aluminum food containers for overseas shipments; aluminum fishing tackle and fly boxes, bait cans.
 Superior Bedding Co., innerspring mattresses.
 Sam W. LeWinter, gas range connectors.
 Enterprise Iron Works, manhole frames and covers.
 Gillcraft Furniture Co., sofa beds.
 Bor-Lenz Enterprises, cigarette lighters.
 Gem Art & Rug Needle Co., needles for rug punch work.
 Babylon Lamp & Shade Co., Inc., wooden table lamps and floor lamps.
 A. J. Bayer Co., stair rail.
 Pacific Southwest Pipe Co., lighting poles.
 C. B. Van Vorst Co., box springs.
 Bauman Bros. Furn. Mfg. Co., box springs, innerspring mattresses.
Burbank—Acme Tool & Mfg. Co., photographic equipment.
El Monte—Blue Devil Mfg. Co., fishing tackle leaders.
Huntington Park—Engineering Associates, fishing swivels.
Inglewood—C. H. Honnell Co., metal household tables.
Pomona—H. W. Loud Machine Works, paper holders for wrapping tissues.
Riverside—E. S. Moody, printing press equipment.
Roscoe—Charles P. Kakac, concrete incinerators (domestic).
Rosemead—Harold C. Landmesser, house trailers.

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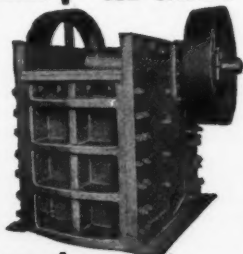
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Shovel Rock to 5"
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WESTERN TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND
SELL INDUSTRIAL EQUIPMENT AND MATERIALS



Ed S. Hudson, for the past two years superintendent of heat treating with the Navy Department at the Naval Air Station in Alameda, is now associated with Western Forge & Tool Works, Oakland, as forging engineer and metallurgist consultant, it is announced by O. W. Busse, manager. He is also instructor in applied metallurgy under the War Training Program at the University of California.

R. W. Pointer, owner-manager of the Pointer-Willamette Company, has announced that his firm has been appointed Northwest distributor for Autocar heavy duty trucks. In addition to the company's three manufacturing plants at Portland, Seattle and Billings, Mont., a new plant is being established at Spokane.

Joining with eight other subsidiaries to become Moore Business Forms, Inc., the Pacific Manifold Book Co. of Emeryville and Los Angeles has announced a change in name. W. H. Mordy, general manager, will retain his position as director of the Western operations for the company and will, in addition, serve as vice president of Moore Business Forms, Inc.

Herbert C. Becker, liaison engineer for Fitel-McCullough, Inc., has returned to the field as field representative of the company. Orrin H. Brown, industrial relations and personnel director for the past two years has become head of the sales engineering department.

R. N. Kuist, for many years sales representative in Seattle for the Stanley Works, New Britain, has succeeded Bruce Findlay as manager of the company's Seattle office. The latter was manager for 23 years and has retired.

The Aircraft Accessories Corp. has changed its name to Aireon Manufacturing Corp. Appointment of Ralph R. Gunderson as sales manager of the brake division of Aircraft Accessories Corp. was announced by John B. Walker, vice president in charge of sales. Mr. Gunderson is the author of "The Brakeman's Handbook."

Ronald H. Dallas has been named assistant general sales manager of Glass Containers, Inc., Los Angeles. Dallas, well known in western trade, has served over 20 years with Glass Containers, Inc. and its predecessor company in various capacities, the most recent of which was as production manager. T. J. Conry takes over this position in production department.

J. J. Buhler has been appointed North-western regional manager for Plomb Tool Co. Los Angeles.

E. C. Hammet has been appointed sales manager for M. N. Thackaberry, Los Angeles. He formerly was connected with the Independent Pneumatic Tool Company.

Hal Young, Kelite service engineer, recently returned from the Hawaiian Islands, has been appointed service supervisor in the Los Angeles area.

Warner & Swasey Company, Cleveland, announce the return of L. R. Hawkins to district managership at Los Angeles, Henry Harkner being transferred to Newark, New Jersey.

Saverite Engineering Co., Los Angeles, announce the appointment of Nott-Atwater Co., Spokane, as their representatives for Eastern Washington, Northern Idaho and Western Montana.

L. O. Carroll, formerly assistant to the vice-president in charge of sales of the Dodge Manufacturing Company, Mishawaka, Ind., and succeeding C. I. Burt, retired, is now Pacific Coast district manager for the company with headquarters at 55 New Montgomery St., San Francisco.

Jack L. Ashby of Oakland has been named general sales manager of the iron and steel division of Kaiser Co., Inc. Norman H. Baalam, also of Oakland will be district sales manager for Southern California. Fred E. Lord, formerly manager of purchases, has been appointed district sales manager for the Pacific Northwest area with company offices opened the first of the year in the Corbett Building, Portland, Oregon. Bert S. Inch, formerly executive assistant to Edgar F. Kaiser, has been appointed general sales manager of the Permanente Metals Corporation, Permanente.

Dean Swift, formerly of Seattle, announces the opening of offices in New York City. He will represent the Western Gear Works' plants at Seattle, Wash., Lynwood and Vernon, Calif., and Western Gear's associate plant, the Pacific Gear & Tool Works of San Francisco.

Tide Water Associated Oil Company announces that Fred G. Stolle has been promoted to the position of supervisor of special products sales for the company's Western division and will be transferred from the Los Angeles district to the company's headquarters in San Francisco. James C. Kilgore succeeds him.

Chicago-Latrobe Twist Drill Works has opened a branch warehouse and sales office at 2043 Santa Fe Ave., Los Angeles. J. C. Malugen is in charge.

Ralph B. Knott has become associated with the Pacific Coast office of McKinsey & Co., San Francisco, being transferred from the Chicago office. He was formerly controller of International Mineral & Chemical Corporation of Chicago.



J. W. Lauts



John Swan

J. W. Lauts has been appointed general sales manager of the Kinney Housewares Division of the Kinney Aluminum Company of Los Angeles. Key men chosen to help build Mr. Lauts' national sales organization are: George Brady, sales manager of Central Division; John Swan, sales manager of Western Division, headquarters Los Angeles; E. P. "Eddie" Richter, sales manager of the Eastern Seaboard area.

Leslie E. Howard has been appointed sales engineer for the Spokane and Salt Lake City territories of the Gould Commercial Division, National Battery Co., St. Paul, Minn.

Elliott R. Vinson of Alameda, former electronics technician at the U. S. Naval Air Station, Alameda, has been appointed electronic tube specialist for the Pacific Coast district, Westinghouse Electric & Mfg. Co.

Roger H. Lueck, formerly connected with the American Can Company's Pacific division, returns to San Francisco offices from New York to assume duties as Coast manager of sales.

C. W. McDaniel, formerly director, vice-president in charge of sales, and secretary of the Fostoria Pressed Steel Corporation, has joined Newmac Co., Ltd., San Francisco, and will direct public relations activities throughout the eleven Western States, Alaska, Pacific Islands and the Orient.

S. B. Maher, for a number of years vice president and general sales manager of the Cooper Company before joining General Electric in 1943, has been appointed as manager of General Electric's distributing branch in Los Angeles. Frank P. Barnes, also of General Electric staff since 1937, has been promoted to district representative for the Transmitter Division and will make his headquarters in San Francisco.

Palmer A. Hewlett, formerly representative at Washington for Consolidated Vultee Aircraft Corp., San Diego, has been appointed export sales director, with headquarters at San Diego. Harvey C. Tafe succeeds Mr. Hewlett at Washington, while O. E. Mecham succeeds Mr. Tafe as service director for the company.

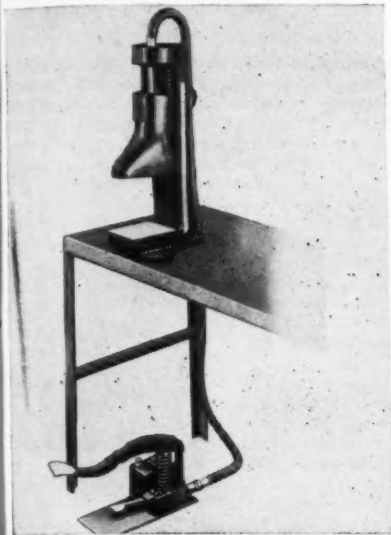
Frank Gawan has been appointed sales engineer for Joy & Cox, Denver.

Bethlehem Steel Company announces that it has acquired all the stock of Pacific Coast Forge Company, which will continue its business with offices at S. Spokane Street and 26th Avenue, S.W., Seattle, Washington under the following executive organization: H. H. Fuller, vice president; P. W. Cotton, general manager of sales; E. B. Hill, assistant treasurer and assistant secretary, L. G. Knight, assistant to vice president. The plant at Seattle will be under the management of T. S. Clingan, general manager and C. H. Beattie, general superintendent.

THE SHOWCASE

123

Bench Press—Reimuller Brothers Co. announce a new Hy-Speed Precision punch press which can be used as a pipe vise, tensile or compression testing machine or a shear for plate or rounds. It is made in a 5-ton size, has a 5 x 6-inch platen



with seven inches of ram movement, and only two levers are used in the hydraulic foot control, leaving operator's hands free when operating. Reimuller Brothers Co., Franklin Park, Ill.

124

Vibration Mount—Rexon, a radically new type of vibration mount, is announced by Hamilton Kent Mfg. Co. Rexon utilizes the time-proven vibration dampening properties of rubber in shear, but with no possibility of overloading the shear elements. This unique property stems from the use of a special "X" type design of the rubber element which acts in shear at the points of the "X" under normal loading, but in compression when the load exceeds the rated capacity of the mount. No rubber-to-metal bonds, either mechanical or chemical, are used. Rexon mounts have almost the double deflection for a given load when compared against standards previously recorded. Installation of Rexon mounts increases the overall height of machines only 1½ to 2 in. Hamilton Kent Mfg. Co., Kent, O.

125

"Silent" Screw Machine Attachment—A new stock tube, eliminating the clattering and banging of the rapidly whirling bar stock, making it possible to carry on conversation between rows of busy automatics and thereby eliminating nervous strain, particularly to women operators, is called the "C-T Silent Stock Tube." Corlett-Turner Company, Chicago, Illinois.

126

Compar Transmission Rings—Rings formerly made of rubber to prevent gear breakage in the event of jamming in power transmission have been found to increase their service life five times when made of compar, a vinyl resin derivative. The material is compounded to give the necessary flexibility, elasticity and abrasion for each particular application. Resistoflex Corp., Belleville, N. J.

127

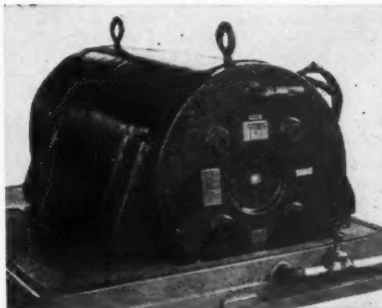
Metal Plating on Glass and Ceramics—The unusual adhesion obtained by Electro Plastic Processes in plating on plastic materials has been further adapted for application to glass and ceramics. Laboratory and field tests indicate greatly improved hermetic sealing, and adhesion obtained is much better than that of other commonly used methods. Either glass or ceramic cases can be plated with a metallic band for soldering to metallic end caps or insulators plated for solder sealing to metallic containers. Electro Plastic Processes, Chicago, Ill.

128

Conveyor—The Tote-All Conveyor, a lightweight, portable endless belt type conveyor, available in two lengths, 13 ft. 9 in., and 20 ft., may be driven by an electric motor or a gasoline engine. Conveyor comes equipped with a 1½ h.p. gasoline engine, or a 2.3 h.p. engine for heavy-duty work, or conveyor may be had without power unit, where user has his own motor. Normal belt speed is 420 r.p.m., and variable speed drive pulley is available if desired. Coal-toter Conveyor Co., Chicago, Illinois.

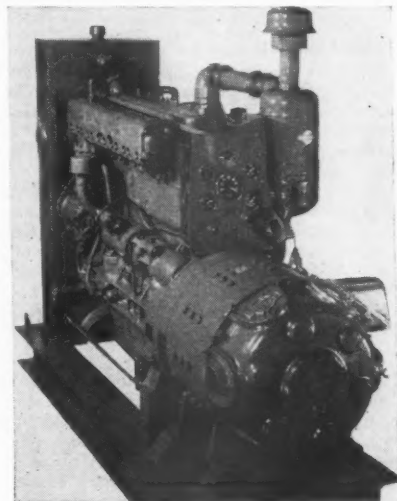
129

Water-cooled Generator—A silent 200 KW generator, hermetically sealed within a strong, single cast frame, is one of the six TOCCO process induction heating machines exhibited in



Cleveland recently. Water enters through the lower water line and circulates within, leaving through the upper or outlet line. Resilient mountings prevent any contact of generator and base. The Ohio Crankshaft Co., Cleveland, Ohio.

Diesel Generating Plant—Originally designed for marine service but equally suitable for industrial applications where small size and maximum output are factors, a new model diesel generating plant is now being produced by Bardco Manufacturing & Sales Company of Los Angeles and Dayton. Both are direct current model and alternating current model have the same rating



at 40 KW for continuous service, and both models have the new single-bearing Bardco generators, operating at 1800 rpm. Bardco automatic safety controls prevent operation at unsafe temperature or oil pressure levels by stopping the plant when pressure reaches predetermined levels. The generators are powered with model T126 Chrysler six-cylinder diesel engines, connected to the generators by patented Bardco flexible couplings. Bardco Manufacturing & Sales Co., Los Angeles, Calif.

131

Laboratory and Industrial Apron—These aprons are particularly well suited for operations in laboratories, battery shops, metal platers, dairies, tanneries, canneries, machine shops and on the farm. A vinyl resin coating makes the high grade cotton fabric waterproof, acid proof, alkali proof, oil and grease resistant. The aprons are flexible, constructed with hemmed edges, reinforced neck and waist tapes. B. F. Goodrich Company, Akron, Ohio.

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132

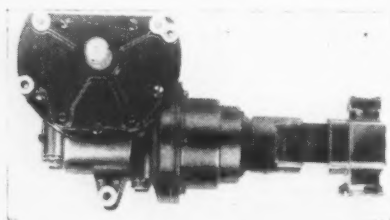
Plastic Rivet—The Plastics Division of the Victory Manufacturing Company have developed an all-plastic rivet moulder in one piece named the "Des-Rivet." It can be applied with a simple gun from one side of a partition, no bucking necessary, is not affected by a wide range of temperature changes, and has the quality of increasing in strength at extremely low temperature. *Victory Mfg. Co., South Pasadena, Calif.*

133

Paint Pump—Designed to supply up to five spray guns simultaneously, the R.M.S. Junior model paint pump delivers paint, thinner, oils and similar spray painting materials to the guns under controlled pressure, without use of a pressure pot, thus the pump can work directly from original material containers as well as from the standard 10-gallon container provided with the pump. Unit is compact and weighs but 45 lbs. complete; it is furnished with an air surge chamber assuring smooth, uniform delivery of material, air regulator, pressure gauge, and air and material line valves with standard spray fittings. *Stephenson Air Brush Paint Company, Oakland, Calif.*

134

Door Actuating Unit—An electric oil cooler door actuating unit, specially built to meet exacting installation conditions and to closest weight limits for aircraft use, has been announced by Electrical Engineering & Mfg. Corp. A 1/8 horsepower thermally-protected motor



equipped with magnetic clutch and brake forms the heart of this compact and completely self-contained motor driven gear reduction unit. Compound planetary reduction of 450 to 1 is provided, with an additional worm and sector reduction of 30 to 1, giving a total reduction of 15,000 to 1. Maximum torque on the drive shaft is 6,000-inch pounds. For use in a 28-volt system. *Electrical Engineering & Mfg. Corp., Los Angeles, Calif.*

135

Polishing Wheel Cement—Michigan Bleach & Chemical Company announces a new synthetic polishing wheel cement, "Gripmaster," which does not "glaze" on the wheel and which fits all grades of adhesives. Gripmaster dries quickly at room temperature, has greater flexibility, and does not need stirring. Full gallon sample offered free to any company writing on their letterhead. *Michigan Bleach & Chemical Co., Detroit, Mich.*

136

Logging Arch—The Hyster Co. announces a new logging arch over 1,000 pounds lighter in weight. Utilizing tubular construction, the main roll larger in diameter to give increased cable life, and equipped with a top horizontal roll to make easier yarding from hillsides, this new unit has the same load capacities and strength as the former Hyster d8 A-frame arch. *Hyster Co., Portland, Oregon.*

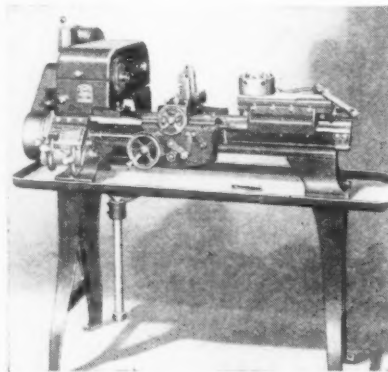
137

Plastic Packing—A new packing, its lasting lubricating effect obtained by combining graphite with flakes of soft, anti-friction metal distributed evenly throughout long line fibres of best grade asbestos, the whole mixed with special heat-resistant binder and formed into con-

tinuous lengths, is introduced by Greene, Tweed & Co. This plastic packing, while not intended to replace braided or plaited packings, has been found advantageous for installation in pumps, valves and on rotating shafts of steam and chemical equipment. *Greene, Tweed & Co., New York, N. Y.*

138

Gear Turret Lathe—The Logan No. 840 quick change gear turret lathe handles bar stock up to and including 5/8 in. diameter, and has such features as precision preloaded ball bearing spindle mounting; adjustable gibs to compensate for wear of turret and cross slide; and self lubricat-



ing bronze bearings protecting 35 vital points in the lathe. The easily operated quick change gear box on the lathe provides 48 threads and feeds in either direction to the carriage, and another interesting feature of this lathe is its automatic apron which operates from a spline in the lead screw through a worm drive friction clutch for both longitudinal and cross feeds. *Logan Engineering Co., Chicago, Illinois.*

139

Disc Grinder—A new all-purpose disc grinder for any type of metal, wood or plastic material has been developed by the Kindt-Collins Company. Made in two similar models, regular and heavy-duty, the principal features of design and construction are, 30-inch disc with 26-inch high grinding area, hydraulic controls, accurate position stop, ventilated table, and paper or cloth discs may be removed and replaced without removing the steel disc. A conveniently located handle operates the hydraulic valve and a 10-inch handwheel controls every hydraulic operation. *Kindt-Collins Co., Cleveland, Ohio.*

140

Floor Machine—In one operation, incrusting grime, grease, metal cuttings and dirt are cut loose and picked up from heavy traffic industrial floors by this Tennant "K" industrial floor machine. Dirt and grease are sheared from floors by a heavy duty 16-inch drum type steel wire brush revolving at 1725 R.P.M., driven by a powerful gasoline or electric motor. Brush hurls metal bits and heavy soilage into built-in pan hopper while powerful vacuum fan sucks lighter material into bag. Machine can also be used for floor sanding and steel wool buffing. *G. H. Tennant Company, Minneapolis, Minn.*

141

Direct-Line Swaged Hook—For the first time, Poulson & Nardon, Inc., offer a hook that can be swaged to the cable, thereby eliminating splicing. This hook has a straight shank and is made from alloy steel in a precision stamping operation that retains the full strength characteristics of the steel. Besides its swaging feature, it has flattened sides, smooth inside surface, round throat, ample radius, and finished point. *Poulson & Nardon, Inc., Los Angeles, Calif.*

142

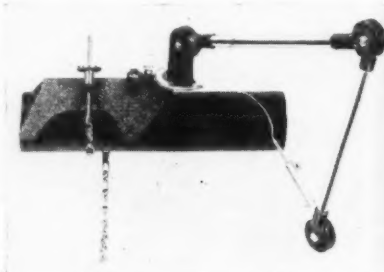
Automatic Tube Master—Model 3CP, a new, completely automatic, Leonard Tube Master for squaring, burring, flaring and beading ferrous and non-ferrous tubing, sizes 1/8 in. to 3 in. O.D., is now available. Like its predecessor, the 1942 Tube Master, it eliminates hand tools and dies in squaring, flaring, burring and beading non-ferrous tubing operations. Model 3CP has greater capacity, is completely automatic and will handle ferrous as well as non-ferrous tubing in all four operations. *Leonard Precision Products Co., Garden Grove, Calif.*

143

Springless Scale Mechanism—Yale & Towne Mfg. Co. announce an improved Kron ball-bearing, springless dial double pendulum type scale mechanism. Combining rugged construction with extreme sensitivity, it speeds weighing, counting, batching, measuring and testing operations with accuracy and dependability. Featuring specially designed ball bearings, the gear sector and shafts carrying the indicator and pendulum arm weights are all mounted in fixed centers. This assures perfect alignment at all times and prevents these parts from being unseated even when they are subjected to shocks or jarring vibrations. *Yale & Towne Mfg. Co., Philadelphia, Pa.*

144

Protractor—Pipe, structural shapes and flat sheets are quickly and accurately scribed for cutting on any angle to one-half of a degree with the Trumark Protractor manufactured by the Tru-Line Corporation. Trumark Protractors are made in two stock models, three sizes. Built for hard service, this protractor is made of pre-



cision-machined cast bronze alloy and steel tubing. Joints are large in diameter and contain special fibre bearings which hold the correct tension and maintain positive alignment, and the marking arm is absolutely rigid throughout its travel. *Tru-Line Corp., Los Angeles, Calif.*

145

Arc Torch—The 9000 Arc Torch provides an electric flame of intense heat, approximately 9000 degrees F., which is pure heat without oxygen or other gas to contaminate the weld, having no pressure to force molten metal away or to blow holes in light sections. Can be used



with any AC or DC electric welder for welding aluminum and its alloys, brass, bronze, red brass, phosphorous bronze, silicon bronze, nickel silver, cast iron and other copper and non-ferrous metals and alloys. For pre-heating all metals prior to welding, for straightening and bending, for hard surfacing where wear-resisting metals are used. *Mid-States Equipment Co., Chicago, Illinois.*

YOURS FOR THE ASKING

1616

Resistance Welding—Written for the non-technician, the booklet, "Tomorrow's Production Today by Resistance Welding" is a brief review of what resistance welding has accomplished, what it is now doing to speed the war effort, and what its future possibilities for post-war metal fabricators will be, because of lessons learned under stress of war. *Resistance Welder Mfrs. Association, Philadelphia, Pa.*

1617

Refrigerator Manual—General Electric offers to servicemen a comprehensive household refrigerator service manual, covering all models equipped with the G-E ScotchYoke Sealed machines, manufactured since 1934. An expanded cross-reference type index, 300 pictures and drawings, and detailed descriptions, cover all of the "whys" and "hows" of the many different models now in customers' homes. *General Electric Company, San Francisco, Calif.*

You owe it to yourself to keep posted—only the efficient business survives under the strain and pressure of the war effort. Literature listed in these columns may be just the answer to your need for greater production, substitute materials or knowledge of how to care for your equipment. Just drop a note to Western Industry, 503 Market St., San Francisco, and copies will be forwarded to you. If you do not use business letterheads, please name your company affiliation.

1618

Cable Swager—Standard Machinery Company have new catalog describing in detail the "Standard" cable swager. *Standard Machinery Company, Providence, R. I.*

1619

Manual on Public Relations—"Good Public Relations for the General Contractor," a 24-page manual on the building of public good will, has been published by the Associated General Contractors of America as part of its public relations program for the general contracting industry. Manual was prepared by Campbell-Ewald Co., Inc., contains a public relations chart, sample advertisements, and project signs and posters for the use of contractors. *Associated General Contractors of America, Inc., New York, N. Y.*

1620

Injection Molding Machine—Lester-Phoenix, Inc., recently printed a four-page booklet about their injection molding machines entitled "Shaping the Things of Tomorrow." *Lester-Phoenix, Inc., Cleveland, Ohio.*

1621

Maintenance of Tools and Dies—The Welding Equipment & Supply Co. has just released a 40-page catalog, illustrating and describing the various applications of "Eureka Tool Steel Welding Electrodes" employed in proper maintenance of tools and dies. This publication contains all necessary technical data, including necessary information on heat treatment. *Victor Equipment Company, San Francisco, Calif.*

1622

Federal Agencies—Citizens National Committee, Inc., has just released a descriptive tabulation of 428 functional units of the Federal Government designed to provide interested citizens with enough accurate information to launch them into consideration of what government should do and how it should operate after V-day. To that end, it provides the name, a description of the function, the method and year of creation, and the appropriation and estimated average personnel for each of the agencies listed as of June 30, 1944. *Citizens National Committee, Inc., Washington, D.C.*

1623

Monthly Availability Lists—Walker-Jamieson, in their expanded October issue of their "Industrial Availability Booklet," lists such items as tubes, test equipment, industrial sound systems, timers, relays, x-ray machines, constant voltage transformers, condensers, resistors, flashlight storage batteries, etc., available from stock. *Walker-Jamieson, Inc., Chicago, Ill.*

1624

Electronic Products—Nine types of electronic tubes for specialized applications are described in a new 24-page bulletin published by Sylvania Electric Products, Inc. Technical sections of the bulletin give specifications, basic circuit diagrams and suggested applications for products and accessories. *Sylvania Electric Products, Inc., Salem, Mass.*

1625

Punching Units—Catalog "H," just off the press, illustrates and describes the new Wales type "H" hole-punching units which punch holes in flanges, angles, container sides and similar shaped and formed work without making expensive, built-up, single purpose, cam action dies. *Walter-Strippit Corporation, North Tonawanda, N. Y.*

1626

After Cooler—Niagara Blower Company issue a Bulletin No. 98 with colored operating drawing of the Niagara Aero After Cooler. *Niagara Blower Co., New York, N. Y.*

1627

Resistance Welding—Progressive Welder Co. has published a 60-page two-color 11 x 8 1/2-in. book containing scores of illustrated examples of resistance welding applications designed as a guide to the variety of uses to which resistance welding adapts itself and whether the work is to be brought to the machine or the equipment brought to the work in fixtures. *Progressive Welder Company, Detroit, Michigan.*



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HERE'S WHY: ★Clear, sturdy plastacele visors assure protection. ★New, exclusive CESCO design permits 15-second visor replacement—visors snap off and on with a turn of the fingers—held fast by spring clips. ★Extra comfortable—contour-shaped, adjustable headgear, soft leather sweatbands.

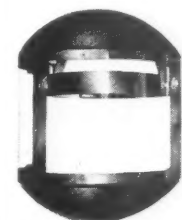
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STYLE 748—8 1/4 x 16-in. visor, fibre half crown



STYLE 438—Helmet style face shield, with replaceable extra-heavy 7x11-in. window



STYLE 439—7x15-in. visor, with half crown and bottom guard (shown at left)

STYLE 749—equipped with 10 x 16-in. visor, open-top headgear (shown at top)

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1628

Measuring Instruments and Controls—A 28-page catalog issue of "Modern Precision" is announced by Leeds & Northrup Co. describing the instruments for measuring by each of L. & N.'s four pyrometric methods: thermocouple, rayotube, thermohm, and optical. A large chart shows the particular instrument model which is available in each case, and another section is devoted to a discussion of L. & N. heat-treating furnaces. *Leeds & Northrup Co., Philadelphia, Pennsylvania.*

1629

Electrical Signals—The new Faraday 61 catalog of electrical signals, handsome and easy to use with its quick-find indexing system, contains helpful engineering data and wiring diagrams, tables of electrical characteristics and especially good photographs for illustrations. *Faraday Electric Corporation, Adrian, Mich.*

1630

Porcelain Enamel—An 8-page booklet entitled "Interesting and Useful Facts About Porcelain Enamel," presenting the advantages of porcelain enamel and giving a brief story on how porcelain enamel is made, together with a detailed list of products and fields where porcelain enamel is used to best advantage, is released by the *Porcelain Enamel Institute, Washington, D.C.*

1631

Neutral Baths—A revised and enlarged edition of their Holden Neutral Bath Folder No. 120, containing information on neutral baths used for hardening and tempering metals, and including data on Holden "Flow Heat Treatment" and the new speed Nitriding Process, is offered by the *A. F. Holden Company, New Haven, Conn.*

1632

Ethyl Cellulose—Two technical booklets on ethyl cellulose, base of many plastics, flexible lacquers, quick-drying varnishes, inks, adhesives, fabric coatings and electrical insulation, have been published by Hercules Powder Company's Cellulose Products Dept. The first 48-page booklet entitled "The Properties and Uses of Ethyl Cellulose," describes the characteristics which have resulted in ethyl cellulose being accepted for so many industrial uses, and the second, entitled "Ethyl Cellulose Formulations with Resins and Plasticizers" shows the practical use of ethyl cellulose. *Hercules Powder Company, Wilmington, Delaware.*

1633

Brochure—The Western Asbestos Co. offers its brochure briefly outlining its products and services, and illustrating and describing its complete activities. *Western Asbestos Company, San Francisco.*

1634

Descriptive Booklet—The American Engineering Company have published an attractive informative booklet of 20 pages in four sections to acquaint its readers with the men, machines, and manufacturing facilities available at American Engineering Company in order to accommodate production needs without extending capital investment during present and peacetime operations. The booklet gives a brief picture of the company's background, its ability, its products, the work it does, its plants and equipment and invites questions of its trained engineers. *American Engineering Company, Philadelphia, Pa.*

1635

Pipe-Line Installations—A new 12-page illustrated booklet, "Oxyacetylene Pipe Line Installations" has been issued by Air Reduction, manufacturers of industrial and rare gases and welding and cutting equipment, giving a concise description of typical oxyacetylene pipe line plans for various size industrial plants. Details on pipe sizes, central depot location, station outlets, safety devices, and other pertinent data are included, and schematic diagrams of piping layouts for typical plants ranging from railroad shops to aircraft welding departments are among the many topics discussed. *Air Reduction, New York, N. Y.*

1636

New Catalog—Continental Foundry & Machine Co. has just published a new 64-page catalog which is a picture story of the company's facilities and products, one section illustrating the foundries, machine shops and roll shops at the Chicago, Pittsburgh, Wheeling and Warwood works, the other two sections dealing with Continental products including types of steel castings and rolling mill equipment and special machinery which Continental has produced. *Continental Foundry & Machine Co., East Chicago, Ind.*

1637

Multiple V-Belt Drive—A booklet prepared under the direction of the Engineering Research Committee of the Multiple V-Belt Drive Association entitled "19 Reasons Why It Is the Dominant Drive of Industry" presents the basic advantages of a multiple V-belt drive. *Multiple V-Belt Drive Association, Chicago, Ill.*

1638

Fluxes—A new catalog describing the complete line of "Superior" fluxes is announced by Superior Flux Company. Included in the line are 20 fluxes for welding, brazing, silver soldering, soft soldering, and low temperature alloy welding of ferrous and non-ferrous metals and alloys. For each flux listed there is included a detailed statement of its characteristics and a full schedule of list prices. *Superior Flux Co., Cleveland, Ohio.*

1639

Rivets—The Pheoll Mfg. Co. offer a 12-page illustrated manual on Hi-Shear rivets, a recent development of North American Aviation, Inc., featuring pertinent facts, greater advantages, gun and squeezer methods of installation, progressive forming, correct length and simplicity of removal. *Pheoll Mfg. Co., Chicago, Ill.*

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